F03-006 pc1

REVIEW COMMENT RECORD (RCR)

1. Date: 1/05/04	2. Review No.
3. Project No.	4. Page 1 of 11 Pages 1/5/04

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Data Validation Report for WSCF20030757		G.S. Thomas		E6-35/373-3907

17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (Optional)	6/23/04 Date; Reviewer/Point of Contract; Author/Originator	6/23/04 Date; Reviewer/Point of Contact; Author/Originator

12. Item	13a. Comment(s)	13b. Basis	13c. Recommendation	14. Reviewer Concurrence Required	15. Disposition (Provide Justification is NOT accepted)	16. Status
	Data Validation Metals and Volatile Organics WSCF20030757					
1	The wrong chain is attached in Appendix 4.					C
	Data Validation Wet Chemistry WSCF20030757					
1	The data validation report on page 1 first sentence under Hold Times section the word metals should be deleted and the words anions and cations be added.					C

RECEIVED
APR 22 2005
EDMC

0064588

ORP-114
(02/02)

ORP - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
12/1/03	
3. Project No.	4. Page 1 of 1
200-PW-2/4 Validation	

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Comments on Data Validation Report for Sample Delivery Group WSCF20030757 (VSR F03-002)	Groundwater Protection Program - Fluor Hanford	SJ Trent	EIS/SDM	Federal Bldg 373-5869

17. Comment Submittal Approval	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (optional)	6/22/04 Date — Reviewer/Point of Contact	6/22/04 Date — Reviewer/Point of Contact
	Requester	Requester

12. Item	13a. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted). Provide separate attachments if necessary.	16. Status
1	Phosphate was validated and flagged UR; however, the validator was instructed to not validate phosphate results. Qualification should be removed and validator should note that phosphate was not validated per FHI request.		Concur	C
2	Validator has validated ortho-terphenyl. I believe that this is a surrogate used in the WTPH-D analysis. Will confirm w/ the laboratory. If confirmed, validator will be requested to remove validation information relative to ortho-terphenyl.		No further information received.	C
	Note to validator on Item #2 - Ortho terphenyl is a surrogate and should not be validated. SJT			

ORP-114
(02/02)

ORP - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
12/1/03	
3. Project No.	**4. Page 1 of 1**
200-PW-2/4 Validation	

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Comments on Data Validation Report for Sample Delivery Group WSCF20030461 (VSR F03-002)	Groundwater Protection Program - Fluor Hanford	SJ Trent	EIS/SDM	Federal Bldg 373-5869

17. Comment Submittal Approval	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (optional)	6/22/04 Date; Reviewer/Point of Contact; Requester	6/22/04 Date; Reviewer/Point of Contact; Requester

12. Item	13a. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted). Provide separate attachments if necessary.	16. Status
1	Phosphate was validated and flagged UR; however, the validator was instructed to not validate phosphate results. Qualification should be removed and validator should note that phosphate was not validated per FHI request.		Concur ✓	C
2	Validator has validated ortho-terphenyl. I believe that this is a surrogate used in the WTPH-D analysis. Will confirm w/ the laboratory. If confirmed, validator will be requested to remove validation information relative to ortho-terphenyl.		No further information ~~required~~ required	C
3	As noted by the validator, MS/MSD information is missing from the report for Al, U, Ba, Zn, and V. The laboratory has been requested to review there reports to see if this information was mistakenly left out. Will submit revised data package report if the MS/MSD information can be retrieved.		No further information required.	C
	Note to validator on Item #2 - ortho-terphenyl is a surrogate and should not be validated. SJT			

FAX

TECHLAW, INC.

3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Steve Trent

From: Bruce Christian

Pages: 1

Date: 26 November 2003

Information Request #9

WSCF20030757-Metals

Was there a specific reason for not running a matrix spike duplicate or laboratory duplicate for the metals analysis??

Here is the e-mail that Steve received from the lab.

Doris here are answers to IR #12 and IR #9.

Steve
-----Original Message-----
From: Fitzgerald, Scot L
Sent: Wednesday, October 29, 2003 1:35 PM
To: Trent, Stephen J
Cc: Trechter, John E Jr.
Subject: FW: Some more data validation questions...

Steve,

Here is the information you requested. For Item number one there are two RPDs one for the sample/dup and one for the MS/MSD. The RPD differences would be expected under the conditions discussed below.

Scot
-----Original Message-----
From: Baird, William W (Bill)
Sent: Wednesday, October 29, 2003 12:37 PM
To: Fitzgerald, Scot L

Subject: RE: Some more data validation questions...

1. The fluoride peak was noted in the comments to have an unidentified compound possibly interfering. The fluoride is flagged with a B and an X. The B is for the concentration being below the lowest cal std but above the MDL, the X is for the possible interfering peak. Here is a quote of the comments:
"IC: Fluoride, nitrite-N and phosphate-P detected, but at
concentrations less than that of the lowest calibration
level. Also unknown peak potentially interfering with
fluoride, which is why matrix spike recoveries and the
relative percent difference between the sample and dup are
high. "
The MS is 127% and the MSD is 120%. This could be accounted for if the sample result was biased low due to the possible interference.

I don't see any reference to a "few percent" in any of the comments in Labcore.

2. The MSD was not spiked (analyst error). Thus, it was not reported. If necessary, we can resurrect and report the unspiked result which could be used as a DUP of the sample.

Bill

-----Original Message-----
From: Fitzgerald, Scot L
Sent: Tuesday, October 28, 2003 3:30 PM
To: Baird, William W (Bill)
Subject: FW: Some more data validation questions...

Bill,

Can you look into these for me?

Scot
-----Original Message-----
From: Neely, Michael
Sent: Tuesday, October 28, 2003 2:41 PM
To: Dale, Troy F; Fitzgerald, Scot L
Cc: Trechter, John E Jr.
Subject: FW: Some more data validation questions...

Troy/Scot:

More questions from Steve - please see below e-mail message.

Thanks,
Mike Neely
Phone: 509-373-0654
Cell: 509-528-2666
Pager: 509-373-PAGE, Extension 6730
FAX: 509-372-0456

-----Original Message-----
From: Trent, Stephen J
Sent: Tuesday, October 28, 2003 2:12 PM
To: Neely, Michael
Subject: Some more data validation questions...

Mike,

Some more questions from the validator -

1) WSCF20030461 - The lab reports the fluoride RPD as 69%, but the MS/MSD RPD calculated by the validator is just a "few percent". Did the lab run a separate duplicate?

2) WSCF20030757 - No MSD or lab duplicate data was provided for metals analysis is it available or was there a reason it is not presented in the data package?

Thanks in advance..

Steve

FAX

TECHLAW, INC.

3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Steve Trent

From: Bruce Christian

Pages: 1

Date: 26 November 2003

Information Request #10

WSCF20030757-VOA re-analysis (WACF20031236),

Do you want this data validated?

No

FAX

TECHLAW, INC.

3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Steve Trent

From: Bruce Christian

Pages: 1

Date: 26 November 2003

Information Request #11

WSCF20030459-rad
WSCF20030461-rad
WSCF20030613-rad
WSCF20030757-rad

I'm not seeing any tracer/carrier yield data reported by WSCF. Is it in the package somewhere and I'm just not seeing it??

Information received from the laboratory and forwarded to Techlaw on 11/13/03

VALIDATION REPORT

SAF NUMBER F03-006

SDG NUMBER WSCF20030757

X DRAFT

_____ FINAL

ORP-114
(02/02)

ORP - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
Nov 24, 2003	N/A
3. Project No.	4. Page 1 of 2
200-PW-2 & 4	

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Data Package SDG WSCP20030757	Groundwater Protection program/200-PW-2 & 4 OU	Bill Thackaberry	Env & Science Assurance (QA)	E6-35 372-0742

17. Comment Submittal Approval	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (optional)	W C Thackaberry Reviewer/Point of Contact 6/11/04 Date Requester	W C Thackaberry Reviewer/Point of Contact 6/11/04 Date Requester

12. Item	13a. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted). Provide separate attachments if necessary.	16. Status
1	Inorganics - pg 1, TechLaw validation letter, introduction cites DOE/RL-2000-60 Draft B. However Rev 1 is in effect and is cited on pg 4.		corr K	C
2	Inorganics - Pg 12, Silver is flagged as J rather than UR. Conflicts with Major deficiency statement on pg 4.		changed to an R K	C
3	Inorganics - Pg 17, This appears to be the wrong chain of custody, wrong sample numbers.		corr K	C
4	Inorganics - pg 20, The accuracy section of the checklist is incomplete.		corr K	C
5	Radiochemistry - pg 1, TechLaw validation letter, introduction cites DOE/RL-2000-60 Draft B. However Rev 1 is in effect and is cited on pg 4		corr K	C
6	PCBs - pg 1, TechLaw validation letter, introduction cites DOE/RL-2000-60 Draft B. However Rev 1 is in effect and is cited on pg 4		corr K	C
7	Volatiles - pg 1, TechLaw validation letter, introduction cites DOE/RL-2000-60 Draft B. However Rev 1 is in effect and is cited on pg 4		corr K	C
8	Semivolatiles - pg 1, TechLaw validation letter, introduction cites DOE/RL-2000-60 Draft B. However Rev 1 is in effect and is cited on pg 4		corr K	C
9	wet Chemistry - pg 1, TechLaw validation letter, introduction cites DOE/RL-2000-60 Draft B. However Rev 1 is in effect and is cited on pg 4		corr K	C

ORP-114
(02/02)

ORP - REVIEW COMMENT RECORD (RCR) (continued)

1. Date	2. Review No.
Nov 24, 2003	N/A
3. Project No.	4. Page 2 of 2
200-PW-2 & 4	

12. Item	13a. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted). Provide separate attachments if necessary.	16. Status
10	Wet Chemistry - Pg 18, This appears to be the wrong chain of custody, wrong sample number.		carr K	C
11	Wet Chemistry - pg 21, Accuracy checklist item "LCB/BSS samples analyzed?" is unanswered.		carr K	C

Date: 17 November 2003
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Subject: Semivolatile - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 30757 prepared by WSCF. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	C	See note 1

1-Semivolatiles by 8270B; TPH-diesel and TPH-gasoline.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times/Sample Preservation**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for

detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike sample analyses are used to assess the analytical accuracy of the reported data. Matrix spike/matrix duplicate results are used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged

"UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/matrix spike duplicate and blank spike results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

Due to the lack of a surrogate analysis, all TPH-G results were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

No field duplicate results were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the target quantitation limits (TQL's) to ensure that laboratory detection levels meet the required criteria. The phenol result exceeded the TQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data package No. 30757 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a surrogate analysis, all TPH-G results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The phenol result exceeded the TQL. Under the FHI statement of work, no qualification is required

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the FHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
TPH-G	J	All	No surrogate analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: FLUOR-HANFORD							
Laboratory: WSCF							
Case:	SDG: WSCF20030757						
Sample Number		B171B9					
Remarks							
Sample Date		5/30/03					
Analysis Date		6/9/03					
Semivolatile (8270B)	TQL	Result	Q	Result	Q	Result	Q
1,2,4-Trichlorobenzene		<1500	U				
1,2-Dichlorobenzene		<1900	U				
1,3-Dichlorobenzene		<1700	U				
1,4-Dichlorobenzene		<1600	U				
2,4,5-Trichlorophenol		<380	U				
2,4,6-Trichlorophenol		<350	U				
2,4-Dichlorophenol		<420	U				
2,4-Dimethylphenol		<350	U				
2,4-Dinitrophenol		<3500	U				
2,4-Dinitrotoluene		<350	U				
2,6-Dinitrotoluene		<350	U				
2-Chloronaphthalene		<420	U				
2-Chlorophenol		<760	U				
2-Methylnaphthalene		<930	U				
2-Methylphenol		<350	U				
2-Nitroaniline		<350	U				
2-Nitrophenol		<900	U				
3 & 4-Methylphenol (total)		<590	U				
3,3-Dichlorobenzidine		<420	U				
3-Nitroaniline		<350	U				
4,6-Dinitro-2-methylphenol		<3500	U				
4-Bromophenyl-phenyl ether		<350	U				
4-Chloro-3-methylphenol		<350	U				
4-Chloroanaline		<480	U				
4-Chlorophenyl-phenyl ether		<350	U				
4-Nitroaniline		<1300	U				
4-Nitrophenol		<3400	U				
Acenaphthene		<350	U				
Acenaphthylene		<420	U				
Anthracene		<350	U				

* - The reported detection limit is above the TQL

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG) Page__2__ of__3__

Project: FLUOR-HANFORD							
Laboratory: WSCF							
Case:	SDG: WSCF20030757						
Sample Number		B171B9					
Remarks							
Sample Date		5/30/03					
Analysis Date		6/9/03					
Semivolatile (8270B)	TQL	Result	Q	Result	Q	Result	Q
Benzo-a-anthracene		<350	U				
Benzo-a-pyrene		<350	U				
Benzo(b)fluoranthene*		<350	U				
Benzo(g,h,i)perylene		<350	U				
Benzo(k)fluoranthene*		<350	U				
bis(2-Ethylhexyl)phthalate		<2900	U				
Bis(2-Chloro-1-methylene)		<1300	U				
Butylbenzylphthalate		<350	U				
Carbazole		<420	U				
Chrysene		<350	U				
Di-n-butylphthalate		<450	U				
Di-n-octylphthalate		<350	U				
Dibenz(a,h)anthracene		<350	U				
Dibenzofuran		<350	U				
Diethylphthalate		<1400	U				
Dimethylphthalate		<350	U				
Fluoranthene		<350	U				
Fluorene		<350	U				
Hexachlorobenzene		<350	U				
Hexachlorobutadiene		<1900	U				
Hexachlorocyclopentadiene		<1600	U				
Hexachloroethane		<2400	U				
Indeno(1,2,3-cd)pyrene		<350	U				
Isopherone		<350	U				
N-Nitroso-di-n-propylamine		<350	U				
N-Nitrosodiphenylamine		<350	U				
Naphthalene		<1500	U				
Nitrobenzene		<1400	U				
Pentachlorophenol		<1600	U				
Phenanthrene		<350	U				
Phenol	330	<520	U				
Pyrene		<350	U				

0010011

* - The reported detection limit is above the TQL

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

bis(2-Chloroethly)eth		<250	U				
bis(2-Chloroethoxy)methane		<120	U				

~~0000012~~ 000011A 6/10/04

*** - The reported detection limit is above the TQL**

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG) Page__4__ of__3__

Project: FLUOR-HANFORD							
Laboratory: WSCF							
Case:	SDG: WSCF20030757						
Sample Number		B171B9					
Remarks							
Sample Date		5/30/03					
TPH	TQL	Result	Q	Result	Q	Result	Q
Kerosene	5	<16000	U				
TPH-Diesel	5	<16000	U				
TPH-Gasoline	5	<500	UJ				

0000011 B Dayus 06/10/04

* - The reported detection limit is above the TQL

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

WSCF
ANALYTICAL RESULTS REPORT

2 - 37

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	7439-98-5	Manganese by ICP-MS	SOLID	LA-505-412		139	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7439-97-6	Mercury by ICP-MS	SOLID	LA-505-412		1.31	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7439-98-7	Molybdenum by ICP-MS	SOLID	LA-505-412	U	< 1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-02-0	Nickel by ICP-MS	SOLID	LA-505-412		5.48	ug/g	4.73	2.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7782-49-2	Selenium by ICP-MS	SOLID	LA-505-412	U	< 1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-22-4	Silver by ICP-MS	SOLID	LA-505-412	EU	< 0.946	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-28-0	Thallium by ICP-MS	SOLID	LA-505-412	U	< 0.473	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-29-1	Thorium by ICP-MS	SOLID	LA-505-412		3.46	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-61-1	Uranium by ICP-MS	SOLID	LA-505-412		28.0	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-62-2	Vanadium by ICP-MS	SOLID	LA-505-412		45.4	ug/g	4.73	1.9	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-66-6	Zinc by ICP-MS	SOLID	LA-505-412		25.4	ug/g	4.73	19	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	TPH-G	Total Pet. Hydrocarbons Gas	SOLID	NWTPH	U	< 500	ug/kg		5.0e+02	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	12674-11-2	Aroclor-1016	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11104-28-2	Aroclor-1221	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11141-16-5	Aroclor-1232	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	53469-21-9	Aroclor-1242	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	12672-29-6	Aroclor-1248	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11097-69-1	Aroclor-1254	SOLID	LA-523-427	J	140	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11096-82-5	Aroclor-1260	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	37324-23-5	Aroclor-1262	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11100-14-4	Aroclor-1268	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	13981-16-3	Pu-238 by AEA	SOLID	LA-508-471	U	-0.120	pCi/g		0.32	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Pu-238 by AEA Total Cntg Error	SOLID	LA-508-471		140	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOLID	LA-508-471		21.0	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	PU-239/240	Pu-239/240 by AEA	SOLID	LA-508-471		3.90	pCi/g		0.077	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	120-82-1	1,2,4-Trichlorobenzene	SOLID	LA-523-456	U	< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	95-50-1	1,2-Dichlorobenzene (SV)	SOLID	LA-523-456	U	< 1.90e+03	ug/kg	1.00	1.9e+03	06/09/03	05/30/03	06/03/03

0000012

MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
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J - Estimated Value

10/15/03

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	541-73-1	1,3-Dichlorobenzene	SOLID	LA-523-456	U	< 1.70e+03	ug/kg	1.00	1.7e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	106-46-7	1,4-Dichlorobenzene (SV)	SOLID	LA-523-456	U	< 1.60e+03	ug/kg	1.00	1.6e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	95-95-4	2,4,5-Trichlorophenol	SOLID	LA-523-456	U	< 380	ug/kg	1.00	3.8e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	88-06-2	2,4,6-Trichlorophenol	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	120-83-2	2,4-Dichlorophenol	SOLID	LA-523-456	U	< 420	ug/kg	1.00	4.2e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	105-67-9	2,4-Dimethylphenol	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	51-28-5	2,4-Dinitrophenol	SOLID	LA-523-456	U	< 3.50e+03	ug/kg	1.00	3.5e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	121-14-2	2,4-Dinitrotoluene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	606-20-2	2,6-Dinitrotoluene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	91-58-7	2-Chloronaphthalene	SOLID	LA-523-456	U	< 420	ug/kg	1.00	4.2e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	95-57-8	2-Chlorophenol	SOLID	LA-523-456	U	< 760	ug/kg	1.00	7.6e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	91-57-6	2-Methylnaphthalene	SOLID	LA-523-456	U	< 930	ug/kg	1.00	9.3e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	95-48-7	2-Methylphenol	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	88-74-4	2-Nitroaniline	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	88-75-5	2-Nitrophenol	SOLID	LA-523-456	U	< 900	ug/kg	1.00	9.0e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	65794-96-9	3 & 4 Methylphenol Total	SOLID	LA-523-456	U	< 590	ug/kg	1.00	5.9e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	91-94-1	3,3'-Dichlorobenzidine	SOLID	LA-523-456	U	< 420	ug/kg	1.00	4.2e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	99-09-2	3-Nitroaniline	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	534-52-1	4,6-Dinitro-2-methylphenol	SOLID	LA-523-456	U	< 3.50e+03	ug/kg	1.00	3.5e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	101-55-3	4-Bromophenyl-phenylether	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	59-50-7	4-Chloro-3-methylphenol	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	106-47-8	4-Chloroaniline	SOLID	LA-523-456	U	< 480	ug/kg	1.00	4.8e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7005-72-3	4-Chlorophenyl-phenylether	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	100-01-6	4-Nitroaniline	SOLID	LA-523-456	U	< 1.30e+03	ug/kg	1.00	1.3e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	100-02-7	4-Nitrophenol	SOLID	LA-523-456	U	< 3.40e+03	ug/kg	1.00	3.4e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	83-32-9	Acenaphthene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	208-96-8	Acenaphthylene	SOLID	LA-523-456	U	< 420	ug/kg	1.00	4.2e+02	06/09/03	05/30/03	06/03/03

0000013

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10/15/03

Report W004/ver. 5.1
Ground Water Protection Program

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4
Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	120-12-7	Anthracene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	56-55-3	Benzo(a)anthracene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	50-32-8	Benzo(a)pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	205-99-2	Benzo(b)fluoranthene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	191-24-2	Benzo(g,h,i)perylene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	207-08-9	Benzo(k)fluoranthene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	117-81-7	Bis (2-Ethylhexyl) phthalate	SOLID	LA-523-456	U	< 2.90e+03	ug/kg	1.00	2.9e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-60-1	Bis(2-Chloro-1-methylene)	SOLID	LA-523-456	U	< 1.30e+03	ug/kg	1.00	1.3e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	85-68-7	Butylbenzylphthalate	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	86-74-8	Carbazole	SOLID	LA-523-456	U	< 420	ug/kg	1.00	4.2e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	218-01-9	Chrysene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	84-74-2	Di-n-butylphthalate	SOLID	LA-523-456	U	< 450	ug/kg	1.00	4.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	117-84-0	Di-n-octylphthalate	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	53-70-3	Dibenz(a,h)anthracene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	132-64-9	Dibenzofuran	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	84-66-2	Diethylphthalate	SOLID	LA-523-456	J	1.40e+03	ug/kg	1.00	9.7e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	131-11-3	Dimethylphthalate	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	206-44-0	Fluoranthene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	86-73-7	Fluorene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	118-74-1	Hexachlorobenzene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	87-68-3	Hexachlorobutadiene	SOLID	LA-523-456	U	< 1.90e+03	ug/kg	1.00	1.9e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	77-47-4	Hexachlorocyclopentadiene	SOLID	LA-523-456	U	< 1.60e+03	ug/kg	1.00	1.6e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	67-72-1	Hexachloroethane	SOLID	LA-523-456	U	< 2.40e+03	ug/kg	1.00	2.4e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	193-39-5	Indeno(1,2,3-cd)pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	78-59-1	Isophorone	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	621-64-7	N-Nitroso-di-n-propylamine	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	86-30-6	N-Nitrosodiphenylamine	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03

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Report W004/ver. 5.1
Ground Water Protection Program

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	91-20-3	Naphthalene	SOLID	LA-523-456	U	< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	98-95-3	Nitrobenzene	SOLID	LA-523-456	U	< 1.40e+03	ug/kg	1.00	1.4e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	87-86-5	Pentachlorophenol	SOLID	LA-523-456	U	< 1.60e+03	ug/kg	1.00	1.6e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	85-01-8	Phenanthrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-95-2	Phenol	SOLID	LA-523-456	U	< 520	ug/kg	1.00	5.2e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	129-00-0	Pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	111-44-4	bis(-2-Chloroethyl)Eth	SOLID	LA-523-456	U	< 1.30e+03	ug/kg	1.00	1.3e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	111-91-1	bis(2-Chloroethoxy)methane	SOLID	LA-523-456	U	< 590	ug/kg	1.00	5.9e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	13966-29-5	U-234 by AEA	SOLID	LA-508-471		4.70	pCi/g		0.063	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-234 by AEA Total Cntg Error	SOLID	LA-508-471		27.0	%		0.0	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	15117-96-1	U-235 by AEA	SOLID	LA-508-471		0.260	pCi/g		0.069	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-235 by AEA Total Cntg Error	SOLID	LA-508-471		47.0	%		0.0	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	24678-82-8	U-238 by AEA	SOLID	LA-508-471		4.70	pCi/g		0.023	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-238 by AEA Total Cntg Error	SOLID	LA-508-471		27.0	%		0.10	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	71-55-6	1,1,1-Trichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	79-00-5	1,1,2-Trichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-34-3	1,1-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-35-4	1,1-Dichloroethene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	107-06-2	1,2-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	540-59-0	1,2-Dichloroethene (cis & tran	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	78-87-5	1,2-Dichloropropane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	78-93-3	2-Butanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	591-78-6	2-Hexanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-10-1	4-Methyl-2-pentanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	67-64-1	Acetone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	71-43-2	Benzene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03

0000135

MDL=Minimum Detection Limit E - Analyte is an estimate, has potentially larger errors J - Estimated Value
RQ=Result Qualifier U - Analyzed for but not detected above limiting criteria.

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols *

Report W004/ver. 5.1
Ground Water Protection Program

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000532	B171C0	GPP TRENT	75-01-4	Vinyl Chloride	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	10061-01-5	cis-1,3-Dichloropropene	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	10061-02-6	trans-1,3-Dichloropropene	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	TPHKEROSENE	Kerosene	SOLID	NWTPH	U	< 1.50e+04	ug/kg	1.00	1.5e+04	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	68476-34-6	Total Pet. Hydrocarbons Diesel	SOLID	NWTPH	U J	< 1.50e+04	ug/kg	1.00	1.5e+04	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	84-15-1	ortho-Terphenyl	SOLID	NWTPH		9.10e+04	ug/kg	1.00	2.0e+03	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7664-41-7	Ammonia (N) by IC	SOLID	LA-503-401		253	ug/g	5.00e+002	2.0	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	57-12-5	Cyanide by Midi/Spectrophotom	SOLID	LA-695-402	U	< 0.200	mg/kg		0.20	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	TS	Percent Solids	SOLID	LA-519-412		96.2	%		0.0	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	PH	pH Soil and Waste Measurement	SOLID	LA-212-411		8.42	pH		0.010	06/11/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14596-10-2	Am-241 by AEA	SOLID	LA-508-471		2.00	pCi/g		0.32	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Am-241 by AEA Total Cntg Error	SOLID	LA-508-471		24.0	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	24959-67-9	Bromide (Br) by IC	SOLID	LA-533-410	U	< 22.5	ug/g	5.00e+002	22	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	16887-00-6	Chloride (Cl) by IC	SOLID	LA-533-410		12.4	ug/g	5.00e+002	7.0	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	16984-48-8	Fluoride (F) by IC	SOLID	LA-533-410	U	< 3.50	ug/g	5.00e+002	3.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	NO3-N	Nitrate (N) by IC	SOLID	LA-533-410		165	ug/g	5.00e+002	2.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	NO2-N	Nitrite (N) by IC	SOLID	LA-533-410	U	< 4.50	ug/g	5.00e+002	4.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14265-44-2	Phosphate (P) by IC	SOLID	LA-533-410	U	< 6.50	ug/g	5.00e+002	6.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14808-79-8	Sulfate (SO4) by IC	SOLID	LA-533-410		647	ug/g	5.00e+002	12	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Ac-228 Rel.% Count Error (GEA)	SOLID	LA-508-462		133	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14331-83-0	Ac-228 by GEA	SOLID	LA-508-462	U	-18.6	pCi/g		41	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Am-241 Rel.% Count Error (GEA)	SOLID	LA-508-462		308	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14596-10-2	Am-241 by GEA	SOLID	LA-508-462	U	-17.8	pCi/g		92	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Bi-212 Rel.% Count Error (GEA)	SOLID	LA-508-462		887	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14913-49-6	Bi-212 by GEA	SOLID	LA-508-462	U	-7.87	pCi/g		1.2e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Bi-214 Rel.% Count Error (GEA)	SOLID	LA-508-462		1.00e+03	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14733-03-0	Bi-214 by GEA	SOLID	LA-508-462	U	-1.75	pCi/g		34	06/13/03	05/30/03	06/03/03

0000015A

MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
U - Analyzed for but not detected above limiting criteria.
J - Estimated Value

10/18/03

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report W004/ver. 5.1
Ground Water Protection Program

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	75-27-4	Bromodichloromethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-25-2	Bromoform	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	74-83-9	Bromomethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-15-0	Carbon Disulfide	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	56-23-5	Carbon Tetrachloride	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-90-7	Chlorobenzene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-00-3	Chloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	67-66-3	Chloroform	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	74-87-3	Chloromethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	124-48-1	Dibromochloromethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	100-41-4	Ethylbenzene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-09-2	Methylene Chloride	SOLID	LA-523-455		1.60e+03	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	100-42-5	Styrene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	127-18-4	Tetrachloroethene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-88-3	Toluene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	1330-20-7	Total Xylenes	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	79-01-6	Trichloroethene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-01-4	Vinyl Chloride	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	10061-01-5	cis-1,3-Dichloropropene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	10061-02-6	trans-1,3-Dichloropropene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	TPHKEROSENE	Kerosene	SOLID	NWTPH	U	< 1.60e+04	ug/kg	1.00	1.6e+04	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	68476-34-6	Total Pet. Hydrocarbons Diesel	SOLID	NWTPH	U	< 1.60e+04	ug/kg	1.00	1.6e+04	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	84-15-1	ortho-Terphenyl	SOLID	NWTPH		9.60e+04	ug/kg	1.00	2.1e+03	06/12/03	05/30/03	06/03/03

0000153B

MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
U - Analyzed for but not detected above limiting criteria.
J - Estimated Value

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report W004/ver. 5.1
Ground Water Protection Program

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	**WSCF20030757**
Sample Matrix	**Soil**
Sample Visual	**Brown**
SAF Number	**F03-006**
Data Deliverable	**Summary Report**

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Protection Program- Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.

- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.

- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.

- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale
WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline
Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-144	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
Johansen/Pope/Pfister	LC Hulstrom 373-3928	TRENT, SJ	8N / 60 Days
Project Designation	**Sampling Location**	**SAF No.**	**Air Quality** ☐
200-PW-2/200-PW-4 OU - Borehole Soil Sampling	216-B-12 (C3246); ~~(32'-35')~~ ~~30-32.5~~ (35.5-38') mS 5-29-03	F03-006	
Ice Chest No.	**Field Logbook No.** HNF-N-3361 / **COA** 117504ES10	**Method of Shipment** Government Vehicle	
Shipped To 222-S Lab Operations WSCF KT 6/3/03	**Offsite Property No.** N/A	**Bill of Lading/Air Bill No.** N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

70030757

Preservation	Cool 4C	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	2	1	~~1~~ 2 mS-30-03	1							
Volume	40mL	40mL	~~120mL~~ 60mL	60mL							
SAMPLE ANALYSIS	VOA - 8260A - Complete	Semi-VOA - 8270A (TCL); PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.							
	STL	STL	W	E					TILTO:		

Sample No.	Matrix *	Sample Date	Sample Time									
B171B9 W0300005337	SOIL	5-30-03	1140							B171P2		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	5-30-03 1415	HO-64-4277 REF	5-30-03 1415
HO-64-4277 Ref	6/03/03 1315	Greg Thomas Greg Thomas	6/3/03 1315
Greg Thomas Greg Thomas	6/03/03 1400	[illegible]	6/3/03 1400

SPECIAL INSTRUCTIONS

**The laboratory is to report both kerosene and diesel range compounds from WTPH-D analysis.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Antimony-125, Cesium-134, Radium-226, Radium-228, Tin-126}; Isotopic Plutonium; Americium-241; Isotopic Uranium; Total Uranium; ICP Metals - 6010A (SW-846) {Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Boron, Lead, Selenium}; Mercury ~~- 7471 - (CV);~~ IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate}; Total Cyanide - 9010; Ammonia - 350.1; pH (Soil) - 9045

~~(2) Technetium-99; Strontium-89,90 - Sr-90; Isotopic Thorium {Thorium-232}; Neptunium-237; Iodine-129~~

WTPH-D & WTPH-G / MAN 06-05-03

#1 - 200.8 & 6010 / MAN 06-05-03

Matrix *

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

020020

3-14

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-PW-2/200-PW-4			DATA PACKAGE: WSCF20030757		
VALIDATOR: TLI		LAB: WSCF		DATE: 10/18/03	
CASE:			SDG: 30757		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270	TPH DRO	SW-846 8270 (TCLP)
SAMPLES/MATRIX					
B17159					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: NO FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... (Yes) No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... (Yes) No N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: NO TPH-G surrogate – J
NO PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed?	(Yes)	No	N/A
MS/MSD RPD values acceptable?	(Yes)	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	(N/A)
MS/MSD standards expired? (Levels D, E)	Yes	No	(N/A)
Field duplicate RPD values acceptable?	Yes	No	(N/A)
Field split RPD values acceptable?	Yes	No	(N/A)
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed?	Yes	No	N/A
Iinternal standard areas acceptable?	Yes	No	N/A
Internal standard retention times acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved?	(Yes)	No	N/A
Sample holding times acceptable?	(Yes)	No	N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)	Yes	No	(N/A)
Compound quantitation acceptable? (Levels D, E)	Yes	No	(N/A)
Results reported for all requested analyses?	(Yes)	No	N/A
Rresults supported in the raw data? (Levels D, E)	Yes	No	(N/A)
Samples properly prepared? (Levels D, E)	Yes	No	(N/A)
Laboratory properly identified and coded all TIC? (Levels D, E)	Yes	No	(N/A)
Detection limits meet RDL?	Yes	(No)	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: phenol over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed?	Yes	(No)	N/A
GPC check performed?	Yes	(No)	N/A
GPC check recoveries acceptable?	Yes	(No)	N/A
GPC calibration performed?	Yes	(No)	N/A
GPC calibration check performed?	Yes	(No)	N/A
GPC calibration check retention times acceptable?	Yes	(No)	N/A
Check/calibration materials traceable?	Yes	(No)	N/A
Check/calibration materials Expired?	Yes	(No)	N/A
Analytical batch QC given similar cleanup?	Yes	(No)	N/A
Transcription/Calculation Errors?	Yes	(No)	N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: SW-846 8270B Semi-Vols

SAF Number: F03-006
Sample Date: 05/31/03
Receive Date: 06/03/03

QC Type	Analyte		CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000528								
BATCH QC ASSOCIATED WITH SAMPLE								
SURR	2-Fluorophenol	Surr	367-12-4	85.900	%Recove	06/09/03	42.000	105.000
SURR	2-Fluorobiphenyl	Surr	321-60-8	92.000	%Recove	06/09/03	56.000	122.000
SURR	Nitrobenzene-d5	Surr	4165-60-0	73.600	%Recove	06/09/03	64.000	111.000
SURR	Phenol-d5	Surr	4165-62-2	85.900	%Recove	06/09/03	54.000	120.000
SURR	2,4,6-Tribromophenol	Surr	118-79-6	73.600	%Recove	06/09/03	24.000	122.000
SURR	Terphenyl-d14	Surr	98904-43-9	98.200	%Recove	06/09/03	35.000	150.000
Lab ID: W030000529								
BATCH QC ASSOCIATED WITH SAMPLE								
SURR	2-Fluorophenol	Surr	367-12-4	71.200	%Recove	06/09/03	42.000	105.000
SURR	2-Fluorobiphenyl	Surr	321-60-8	77.200	%Recove	06/09/03	56.000	122.000
SURR	Nitrobenzene-d5	Surr	4165-60-0	71.200	%Recove	06/09/03	64.000	111.000
SURR	Phenol-d5	Surr	4165-62-2	77.200	%Recove	06/09/03	54.000	120.000
SURR	2,4,6-Tribromophenol	Surr	118-79-6	59.400	%Recove	06/09/03	24.000	122.000
SURR	Terphenyl-d14	Surr	98904-43-9	95.000	%Recove	06/09/03	35.000	150.000
Lab ID: W030000530								
BATCH QC ASSOCIATED WITH SAMPLE								
SURR	2-Fluorophenol	Surr	367-12-4	73.200	%Recove	06/09/03	42.000	105.000
SURR	2-Fluorobiphenyl	Surr	321-60-8	73.200	%Recove	06/09/03	56.000	122.000
SURR	Nitrobenzene-d5	Surr	4165-60-0	67.100	%Recove	06/09/03	64.000	111.000
SURR	Phenol-d5	Surr	4165-62-2	73.200	%Recove	06/09/03	54.000	120.000
SURR	2,4,6-Tribromophenol	Surr	118-79-6	73.200	%Recove	06/09/03	24.000	122.000
SURR	Terphenyl-d14	Surr	98904-43-9	97.600	%Recove	06/09/03	35.000	150.000
Lab ID: W030000531								
BATCH QC ASSOCIATED WITH SAMPLE								
SURR	2-Fluorophenol	Surr	367-12-4	85.300	%Recove	06/09/03	42.000	105.000
SURR	2-Fluorobiphenyl	Surr	321-60-8	85.300	%Recove	06/09/03	56.000	122.000
SURR	Nitrobenzene-d5	Surr	4165-60-0	72.200	%Recove	06/09/03	64.000	111.000
SURR	Phenol-d5	Surr	4165-62-2	72.200	%Recove	06/09/03	54.000	120.000
SURR	2,4,6-Tribromophenol	Surr	118-79-6	72.200	%Recove	06/09/03	24.000	122.000
SURR	Terphenyl-d14	Surr	98904-43-9	98.400	%Recove	06/09/03	35.000	150.000
Lab ID: W030000532								
BATCH QC ASSOCIATED WITH SAMPLE								
MS	1,2,4-Trichlorobenzene		120-82-1	79.400	% Recov	06/09/03	46.000	107.000
MS	1,4-Dichlorobenzene (SV)		106-46-7	85.500	% Recov	06/09/03	30.000	96.000
MS	2,4-Dinitrotoluene		121-14-2	79.400	% Recov	06/09/03	59.000	106.000
MS	2-Fluorophenol	Surr	367-12-4	85.500	%Recove	06/09/03	42.000	105.000
MS	Acenaphthene		83-32-9	85.500	% Recov	06/09/03	61.000	116.000
MS	4-Chloro-3-methylphenol		59-50-7	81.500	% Recov	06/09/03	61.000	106.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: SW-846 8270B Semi-Vols

SAF Number: F03-006
Sample Date: 05/30/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
MS	2-Chlorophenol	95-57-8	81.500	% Recov	06/09/03	66.000	106.000
MS	N-Nitroso-di-n-propylamine	621-64-7	85.500	% Recov	06/09/03	71.000	114.000
MS	2-Fluorobiphenyl Surr	321-60-8	85.500	%Recove	06/09/03	56.000	122.000
MS	Phenol	108-95-2	89.600	% Recov	06/09/03	42.000	111.000
MS	Nitrobenzene-d5 Surr	4165-60-0	73.300	%Recove	06/09/03	64.000	111.000
MS	4-Nitrophenol	100-02-7	69.200	% Recov	06/09/03	32.000	118.000
MS	Pentachlorophenol	87-86-5	65.200	% Recov	06/09/03	62.000	114.000
MS	Phenol-d5 Surr	4165-62-2	73.300	%Recove	06/09/03	54.000	120.000
MS	Pyrene	129-00-0	85.500	% Recov	06/09/03	66.000	118.000
MS	2,4,6-Tribromophenol Surr	118-79-6	79.400	%Recove	06/09/03	24.000	122.000
MS	Terphenyl-d14 Surr	98904-43-9	97.800	%Recove	06/09/03	35.000	150.000
MSD	1,2,4-Trichlorobenzene	120-82-1	85.600	% Recov	06/10/03	46.000	107.000
MSD	1,4-Dichlorobenzene (SV)	106-46-7	85.600	% Recov	06/10/03	30.000	98.000
MSD	2,4-Dinitrotoluene	121-14-2	73.300	% Recov	06/10/03	59.000	106.000
MSD	2-Fluorophenol Surr	367-12-4	85.600	%Recove	06/10/03	42.000	105.000
MSD	Acenaphthene	83-32-9	85.600	% Recov	06/10/03	61.000	116.000
MSD	4-Chloro-3-methylphenol	59-50-7	81.500	% Recov	06/10/03	61.000	106.000
MSD	2-Chlorophenol	95-57-8	81.500	% Recov	06/10/03	66.000	106.000
MSD	N-Nitroso-di-n-propylamine	621-64-7	85.600	% Recov	06/10/03	71.000	114.000
MSD	2-Fluorobiphenyl Surr	321-60-8	85.600	%Recove	06/10/03	56.000	122.000
MSD	Phenol	108-95-2	85.600	% Recov	06/10/03	42.000	111.000
MSD	Nitrobenzene-d5 Surr	4165-60-0	85.600	%Recove	06/10/03	64.000	111.000
MSD	4-Nitrophenol	100-02-7	73.300	% Recov	06/10/03	32.000	118.000
MSD	Pentachlorophenol	87-86-5	65.200	% Recov	06/10/03	62.000	114.000
MSD	Phenol-d5 Surr	4165-62-2	79.500	%Recove	06/10/03	54.000	120.000
MSD	Pyrene	129-00-0	85.600	% Recov	06/10/03	66.000	118.000
MSD	2,4,6-Tribromophenol Surr	118-79-6	79.500	%Recove	06/10/03	24.000	122.000
MSD	Terphenyl-d14 Surr	98904-43-9	97.800	%Recove	06/10/03	35.000	150.000
SPK-RPD	1,2,4-Trichlorobenzene	120-82-1	7.515	RPD	06/09/03	0.000	20.000
SPK-RPD	1,4-Dichlorobenzene (SV)	106-46-7	0.117	RPD	06/09/03	0.000	20.000
SPK-RPD	2,4-Dinitrotoluene	121-14-2	7.990	RPD	06/09/03	0.000	20.000
SPK-RPD	2-Fluorophenol Surr	367-12-4	100.117	%Recove	06/09/03	42.000	105.000
SPK-RPD	Acenaphthene	83-32-9	0.117	RPD	06/09/03	0.000	20.000
SPK-RPD	4-Chloro-3-methylphenol	59-50-7	0.000	RPD	06/09/03	0.000	20.000
SPK-RPD	2-Chlorophenol	95-57-8	0.000	RPD	06/09/03	0.000	20.000
SPK-RPD	N-Nitroso-di-n-propylamine	621-64-7	0.117	RPD	06/09/03	0.000	20.000
SPK-RPD	2-Fluorobiphenyl Surr	321-60-8	100.117	%Recove	06/09/03	56.000	122.000
SPK-RPD	Phenol	108-95-2	4.566	RPD	06/09/03	0.000	20.000
SPK-RPD	Nitrobenzene-d5 Surr	4165-60-0	118.780	%Recove	06/09/03	64.000	111.000 *
SPK-RPD	4-Nitrophenol	100-02-7	5.754	RPD	06/09/03	0.000	20.000
SPK-RPD	Pentachlorophenol	87-86-5	0.000	RPD	06/09/03	0.000	20.000
SPK-RPD	Phenol-d5 Surr	4165-62-2	108.458	%Recove	06/09/03	54.000	120.000
SPK-RPD	Pyrene	129-00-0	0.117	RPD	06/09/03	0.000	20.000
SPK-RPD	2,4,6-Tribromophenol Surr	118-79-6	100.126	%Recove	06/09/03	24.000	122.000
SPK-RPD	Terphenyl-d14 Surr	98904-43-9	100.000	%Recove	06/09/03	35.000	150.000
SURR	2-Fluorophenol Surr	367-12-4	81.400	%Recove	06/09/03	42.000	105.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: SW-846 8270B Semi-Vols

SAF Number: F03-006
Sample Date: 05/30/03
Receive Date: 06/03/03

QC Type	Analyte		CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
SURR	2-Fluorobiphenyl	Surr	321-60-8	87.700	%Recove	06/09/03	56.000	122.000
SURR	Nitrobenzene-d5	Surr	4165-60-0	68.900	%Recove	06/09/03	64.000	111.000
SURR	Phenol-d5	Surr	4165-62-2	81.400	%Recove	06/09/03	54.000	120.000
SURR	2,4,6-Tribromophenol	Surr	118-79-6	75.100	%Recove	06/09/03	24.000	122.000
SURR	Terphenyl-d14	Surr	98904-43-9	93.900	%Recove	06/09/03	35.000	150.000

Lab ID: W030000533

BATCH QC ASSOCIATED WITH SAMPLE

SURR	2-Fluorophenol	Surr	367-12-4	78.100	%Recove	06/09/03	42.000	105.000
SURR	2-Fluorobiphenyl	Surr	321-60-8	90.100	%Recove	06/09/03	56.000	122.000
SURR	Nitrobenzene-d5	Surr	4165-60-0	84.100	%Recove	06/09/03	64.000	111.000
SURR	Phenol-d5	Surr	4165-62-2	90.100	%Recove	06/09/03	54.000	120.000
SURR	2,4,6-Tribromophenol	Surr	118-79-6	60.100	%Recove	06/09/03	24.000	122.000
SURR	Terphenyl-d14	Surr	98904-43-9	90.100	%Recove	06/09/03	35.000	150.000

BATCH QC

BLANK	1,2-Dichlorobenzene (SV)	95-50-1	< 1800	ug/Kg	06/09/03		
BLANK	1,2,4-Trichlorobenzene	120-82-1	< 1500	ug/Kg	06/09/03		
BLANK	1,3-Dichlorobenzene	541-73-1	< 1600	ug/Kg	06/09/03		
BLANK	1,4-Dichlorobenzene (SV)	106-46-7	< 1600	ug/Kg	06/09/03		
BLANK	2,4-Dichlorophenol	120-83-2	< 400	ug/Kg	06/09/03		
BLANK	2,4-Dinitrotoluene	121-14-2	< 330	ug/Kg	06/09/03		
BLANK	2,4,5-Trichlorophenol	95-95-4	< 370	ug/Kg	06/09/03		
BLANK	2,4,6-Trichlorophenol	88-06-2	< 330	ug/Kg	06/09/03		
BLANK	2,4-Dimethylphenol	105-67-9	< 330	ug/Kg	06/09/03		
BLANK	2,6-Dinitrotoluene	606-20-2	< 330	ug/Kg	06/09/03		
BLANK	2-Butoxyethanol	111-76-2	< 500	ug/Kg	06/09/03		
BLANK	2-Chloronaphthalene	91-58-7	< 400	ug/Kg	06/09/03		
BLANK	2-Fluorophenol Surr	367-12-4	78.000	%Recove	06/09/03	42.000	105.000
BLANK	2-Methylnaphthalene	91-57-6	< 900	ug/Kg	06/09/03		
BLANK	2-Methylphenol	95-48-7	< 330	ug/Kg	06/09/03		
BLANK	2-Nitroaniline	88-74-4	< 330	ug/Kg	06/09/03		
BLANK	2-Nitrophenol	88-75-5	< 870	ug/Kg	06/09/03		
BLANK	3 & 4 Methylphenol Total	65794-96-9	< 570	ug/Kg	06/09/03	0.000	300.000
BLANK	3-Nitroaniline	99-09-2	< 330	ug/Kg	06/09/03		
BLANK	4,6-Dinitro-2-methylphenol	534-52-1	< 3300	ug/Kg	06/09/03		
BLANK	4-Bromophenyl-phenylether	101-55-3	< 330	ug/Kg	06/09/03		
BLANK	4-Chlorophenyl-phenylether	7005-72-3	< 330	ug/Kg	06/09/03		
BLANK	Acenaphthene	83-32-9	< 330	ug/Kg	06/09/03		
BLANK	Acenaphthylene	208-96-8	< 400	ug/Kg	06/09/03		
BLANK	Anthracene	120-12-7	< 330	ug/Kg	06/09/03		
BLANK	bis(-2-Chloroethyl)Eth	111-44-4	< 1200	ug/Kg	06/09/03		
BLANK	Benzo(a)anthracene	56-55-3	< 330	ug/Kg	06/09/03		
BLANK	Benzo(b)fluoranthene	205-99-2	< 330	ug/Kg	06/09/03		
BLANK	Benzo(g,h,i)perylene	191-24-2	< 330	ug/Kg	06/09/03		
BLANK	Benzo(a)pyrene	50-32-8	< 330	ug/Kg	06/09/03		

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: SW-846 8270B Semi-Vols

SAF Number: F03-006
Sample Date:
Receive Date:

QC Type	Analyte		CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
BLANK	bis(2-Chloroethoxy)methane		111-91-1	< 570	ug/Kg	06/09/03		
BLANK	Bis (2-Ethylhexyl) phthalate		117-81-7	< 2800	ug/Kg	06/09/03		
BLANK	Bis(2-Chloro-1-methylene)		108-60-1	< 1300	ug/Kg	06/09/03	0.000	10.000
BLANK	Benzo(k)fluoranthene		207-08-9	< 330	ug/Kg	06/09/03		
BLANK	Butylbenzylphthalate		85-68-7	< 330	ug/Kg	06/09/03		
BLANK	Carbazole		86-74-8	< 400	ug/Kg	06/09/03		
BLANK	4-Chloroaniline		106-47-8	< 470	ug/Kg	06/09/03		
BLANK	4-Chloro-3-methylphenol		59-50-7	< 330	ug/Kg	06/09/03		
BLANK	2-Chlorophenol		95-57-8	< 730	ug/Kg	06/09/03		
BLANK	Chrysene		218-01-9	< 330	ug/Kg	06/09/03		
BLANK	3,3'-Dichlorobenzidine		91-94-1	< 400	ug/Kg	06/09/03		
BLANK	Dibenz(a,h)anthracene		53-70-3	< 330	ug/Kg	06/09/03		
BLANK	Dibenzofuran		132-64-9	< 330	ug/Kg	06/09/03		
BLANK	Di-n-butylphthalate		84-74-2	< 430	ug/Kg	06/09/03		
BLANK	Diethylphthalate		84-66-2	< 930	ug/Kg	06/09/03		
BLANK	Dimethylphthalate		131-11-3	< 330	ug/Kg	06/09/03		
BLANK	2,4-Dinitrophenol		51-28-5	< 3300	ug/Kg	06/09/03		
BLANK	Di-n-octylphthalate		117-84-0	< 330	ug/Kg	06/09/03		
BLANK	N-Nitroso-di-n-propylamine		621-64-7	< 330	ug/Kg	06/09/03		
BLANK	2-Fluorobiphenyl	Surr	321-60-8	90.000	%Recove	06/09/03	56.000	122.000
BLANK	Fluorene		86-73-7	< 330	ug/Kg	06/09/03		
BLANK	Fluoranthene		206-44-0	< 330	ug/Kg	06/09/03		
BLANK	Hexachlorobenzene		118-74-1	< 330	ug/Kg	06/09/03		
BLANK	Hexachlorobutadiene		87-68-3	< 1800	ug/Kg	06/09/03		
BLANK	Hexachlorocyclopentadiene		77-47-4	< 1600	ug/Kg	06/09/03		
BLANK	Hexachloroethane		67-72-1	< 2300	ug/Kg	06/09/03		
BLANK	Indeno(1,2,3-cd)pyrene		193-39-5	< 330	ug/Kg	06/09/03		
BLANK	Isophorone		78-59-1	< 330	ug/Kg	06/09/03		
BLANK	Phenol		108-95-2	< 500	ug/Kg	06/09/03		
BLANK	Naphthalene		91-20-3	< 1400	ug/Kg	06/09/03		
BLANK	Nitrobenzene-d5	Surr	4165-60-0	84.000	%Recove	06/09/03	54.000	111.000
BLANK	Nitrobenzene		98-95-3	< 1300	ug/Kg	06/09/03		
BLANK	4-Nitrophenol		100-02-7	< 3200	ug/Kg	06/09/03		
BLANK	4-Nitroaniline		100-01-6	< 1200	ug/Kg	06/09/03		
BLANK	N-Nitrosodiphenylamine		86-30-6	< 330	ug/Kg	06/09/03		
BLANK	Pentachlorophenol		87-86-5	< 1500	ug/Kg	06/09/03		
BLANK	Phenanthrene		85-01-8	< 330	ug/Kg	06/09/03		
BLANK	Phenol-d5	Surr	4165-62-2	78.000	%Recove	06/09/03	54.000	120.000
BLANK	Pyrene		129-00-0	< 330	ug/Kg	06/09/03		
BLANK	Tri-n-butylphosphate		126-73-8	< 330	ug/Kg	06/09/03		
BLANK	2,4,6-Tribromophenol	Surr	118-79-6	72.000	%Recove	06/09/03	24.000	122.000
BLANK	Terphenyl-d14	Surr	98904-43-9	90.000	%Recove	06/09/03	35.000	150.000
LCS	1,2,4-Trichlorobenzene		120-82-1	84.000	% Recov	06/09/03	46.000	107.000
LCS	1,4-Dichlorobenzene (SV)		106-46-7	90.000	% Recov	06/09/03	42.000	111.000
LCS	2,4-Dinitrotoluene		121-14-2	76.000	% Recov	06/09/03	59.000	106.000
LCS	2-Fluorophenol	Surr	367-12-4	84.000	% Recov	06/09/03	50.000	110.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: SW-846 8270B Semi-Vols

SAF Number: F03-006
Sample Date:
Receive Date:

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
LCS	Acenaphthene	83-32-9	90.000	% Recov	06/09/03	61.000	116.000
LCS	4-Chloro-3-methylphenol	59-50-7	80.000	% Recov	06/09/03	61.000	106.000
LCS	2-Chlorophenol	95-57-8	84.000	% Recov	06/09/03	66.000	106.000
LCS	N-Nitroso-di-n-propylamine	621-64-7	90.000	% Recov	06/09/03	71.000	114.000
LCS	2-Fluorobiphenyl Surr	321-60-8	84.000	% Recov	06/09/03	58.000	109.000
LCS	Phenol	108-95-2	88.000	% Recov	06/09/03	67.000	105.000
LCS	Nitrobenzene-d5 Surr	4165-60-0	78.000	% Recov	06/09/03	60.000	118.000
LCS	4-Nitrophenol	100-02-7	76.000	% Recov	06/09/03	32.000	118.000
LCS	Pentachlorophenol	87-86-5	68.000	% Recov	06/09/03	62.000	114.000
LCS	Phenol-d5 Surr	4165-62-2	78.000	% Recov	06/09/03	59.000	116.000
LCS	Pyrene	129-00-0	84.000	% Recov	06/09/03	66.000	118.000
LCS	2,4,6-Tribromophenol Surr	118-79-6	78.000	% Recov	06/09/03	60.000	120.000
LCS	Terphenyl-d14 Surr	98904-43-9	90.000	% Recov	06/09/03	60.000	120.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: WTPH-D TPH Diesel Range (Wa)

SAF Number: F03-006
Sample Date: 05/31/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000528							
BATCH QC ASSOCIATED WITH SAMPLE							
SURR	ortho-Terphenyl	84-15-1	108.000	% Recov	06/12/03	70.000	130.000
Lab ID: W030000529							
BATCH QC ASSOCIATED WITH SAMPLE							
SURR	ortho-Terphenyl	84-15-1	78.000	% Recov	06/12/03	70.000	130.000
Lab ID: W030000530							
BATCH QC ASSOCIATED WITH SAMPLE							
SURR	ortho-Terphenyl	84-15-1	99.100	% Recov	06/12/03	70.000	130.000
Lab ID: W030000531							
BATCH QC ASSOCIATED WITH SAMPLE							
SURR	ortho-Terphenyl	84-15-1	94.100	% Recov	06/12/03	70.000	130.000
Lab ID: W030000532							
BATCH QC ASSOCIATED WITH SAMPLE							
MS	ortho-Terphenyl	84-15-1	91.000	% Recov	06/12/03	70.000	130.000
MS	Total Pet. Hydrocarbons Diesel	68476-34-6	120.000	% Recov	06/12/03	75.000	125.000
MSD	ortho-Terphenyl	84-15-1	114.000	% Recov	06/12/03	70.000	130.000
MSD	Total Pet. Hydrocarbons Diesel	68476-34-6	113.000	% Recov	06/12/03	75.000	125.000
SPK-RPD	ortho-Terphenyl	84-15-1	22.439	RPD	06/12/03	0.000	20.000 *
SPK-RPD	Total Pet. Hydrocarbons Diesel	68476-34-6	6.009	RPD	06/12/03	0.000	20.000
SURR	ortho-Terphenyl	84-15-1	90.800	% Recov	06/12/03	70.000	130.000
Lab ID: W030000533							
BATCH QC ASSOCIATED WITH SAMPLE							
SURR	ortho-Terphenyl	84-15-1	92.900	% Recov	06/12/03	70.000	130.000
BATCH QC							
BLANK	Kerosene	TPHKEROSENE	< 15	ug/Kg	06/12/03	0.000	100.000
BLANK	ortho-Terphenyl	84-15-1	0.00	ug/Kg	06/12/03	70.000	130.000 *
BLANK	Total Pet. Hydrocarbons Diesel	68476-34-6	< 15	ug/Kg	06/12/03	0.000	300.000
LCS	ortho-Terphenyl	84-15-1	108.000	% Recov	06/12/03	70.000	130.000
LCS	Total Pet. Hydrocarbons Diesel	68476-34-6	99.900	% Recov	06/12/03	80.000	120.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: NWTPH-GX TPH Gasoline Range

SAF Number: F03-006
Sample Date: 05/30/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000532							
BATCH QC ASSOCIATED WITH SAMPLE							
DUP	Total Pet. Hydrocarbons Gas	TPH-G	n/a	RPD	06/12/03	0.000	20.000
MS	Total Pet. Hydrocarbons Gas	TPH-G	94.000	% Recov	06/12/03	50.000	150.000
MSD	Total Pet. Hydrocarbons Gas	TPH-G	106.000	% Recov	06/12/03	50.000	150.000
SPK-RPD	Total Pet. Hydrocarbons Gas	TPH-G	12.000	RPD	06/12/03	0.000	20.000
BATCH QC							
BLANK	Total Pet. Hydrocarbons Gas	TPH-G	<50	mg/L	06/12/03	0.000	300.000
LCS	Total Pet. Hydrocarbons Gas	TPH-G	107.000	% Recov	06/12/03	85.000	115.000

Date: 17 November 2003
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Subject: Radiochemistry - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. 30459 which was prepared by WSCF. A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	C	See note 1 & 2

1 - Gamma spectroscopy and alpha spectroscopy.
2 - Gamma spectroscopy results for sample B16W99 were re-analyzed and reported separately in data package WSCF20031181. It is the re-analysis data that was validated and is contained in this report.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Laboratory (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the required detection limit (RDL), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the minimum detectable activity (MDA) are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is 80-120%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

All accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection limit (CRDL) and the RPD is less than +/- 35 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or

equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPDs outside QC limits, bismuth-214 (60.5%), lead-214 (48.1%), radium-226 (60.5%) and thallium-208 (44.8%) results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

No field duplicate results were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels are compared against the target quanitiation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. Two analytes were reported above the TQL. Under the FHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific TQL.

- **Completeness**

Data package SDG No. 30757 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an RPDs outside QC limits, all bismuth-214 (60.5%), lead-214 (48.1%), radium-226 (60.5%) and thallium-208 (44.8%) results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Two analytes were reported above the TQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the FHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMICAL DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bismuth-214 Lead-214 Radium-226 Thallium-208	J	All	RPD

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: FLUOR-HANFORD							
Laboratory: EB							
Case	SDG: WSCF20030767						
Sample Number		B171B9					
Remarks							
Location							
Sample Date		5/30/03					
Radiochemistry	TQL	Result	Q	Result	Q	Result	Q
Americium-241	1	2.00					
Plutonium-238	1	-0.120	U				
Plutonium-239/240	1	3.90					
Uranium-234	1	4.70					
Uranium-235	1	0.260					
Uranium-238	1	4.70					
Cobalt-60	0.05	-0.188	U				
Antimony-125		-20.9	U				
Cesium-134		-2.33	U				
Cesium-137	0.1	61900					
Europium 152	0.1	-20.2	U				
Europium 154	0.1	-3.16	U				
Europium 155	0.1	34.9					
Tin-126		10.4	U				
Radium-228*	0.2	2.23	U				
Radium-226*	0.1	7.12	UJ				
Zinc-65		6.25	U				
Niobium-94		0.916	U				
Ru-103		-2.03	U				
Ru-106		-16.1	U				
Tin-113		6.99	U				
Cerium-144		49.2	U				
Thallium-208		2.95	UJ				
Bismuth-212		-6.32	U				
Lead-212		15.5	U				
Bismuth-214		7.12	UJ				
Lead-214		-8.19	UJ				
Actinium-228		2.23	U				
Thorium-234		148	U				
Uranium-235		65.4	U				
Americium-241		-44.6	U				

000010

* - TDL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000532	B171C0	GPP TRENT	75-01-4	Vinyl Chloride	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	10061-01-5	cis-1,3-Dichloropropene	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	10061-02-6	trans-1,3-Dichloropropene	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	TPHKEROSENE	Kerosene	SOLID	NWTPH	U	< 1.50e+04	ug/kg	1.00	1.5e+04	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	68476-34-6	Total Pet. Hydrocarbons Diesel	SOLID	NWTPH	U	< 1.50e+04	ug/kg	1.00	1.5e+04	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	84-15-1	ortho-Terphenyl	SOLID	NWTPH		9.10e+04	ug/kg	1.00	2.0e+03	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7664-41-7	Ammonia (N) by IC	SOLID	LA-503-401		253	ug/g	5.00e+002	2.0	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	57-12-5	Cyanide by Midi/Spectrophotom	SOLID	LA-695-402	U	< 0.200	mg/kg		0.20	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	TS	Percent Solids	SOLID	LA-519-412		96.2	%		0.0	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	PH	pH Soil and Waste Measurement	SOLID	LA-212-411		8.42	pH		0.010	06/11/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14596-10-2	Am-241 by AEA	SOLID	LA-508-471		2.00	pCi/g		0.32	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Am-241 by AEA Total Cntg Error	SOLID	LA-508-471		24.0	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	24959-67-9	Bromide (Br) by IC	SOLID	LA-533-410	U	< 22.5	ug/g	5.00e+002	22	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	16887-00-6	Chloride (Cl) by IC	SOLID	LA-533-410		12.4	ug/g	5.00e+002	7.0	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	16984-48-8	Fluoride (F) by IC	SOLID	LA-533-410	U	< 3.50	ug/g	5.00e+002	3.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	NO3-N	Nitrate (N) by IC	SOLID	LA-533-410		165	ug/g	5.00e+002	2.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	NO2-N	Nitrite (N) by IC	SOLID	LA-533-410	U	< 4.50	ug/g	5.00e+002	4.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14265-44-2	Phosphate (P) by IC	SOLID	LA-533-410	U	< 6.50	ug/g	5.00e+002	6.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14808-79-8	Sulfate (SO4) by IC	SOLID	LA-533-410		647	ug/g	5.00e+002	12	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Ac-228 Rel.% Count Error (GEA)	SOLID	LA-508-462		133	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14331-83-0	Ac-228 by GEA	SOLID	LA-508-462	U	-18.6	pCi/g		41	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Am-241 Rel.% Count Error (GEA)	SOLID	LA-508-462		308	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14596-10-2	Am-241 by GEA	SOLID	LA-508-462	U	-17.8	pCi/g		92	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Bi-212 Rel.% Count Error (GEA)	SOLID	LA-508-462		887	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14913-49-6	Bi-212 by GEA	SOLID	LA-508-462	U	-7.87	pCi/g		1.2e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Bi-214 Rel.% Count Error (GEA)	SOLID	LA-508-462		1.00e+03	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14733-03-0	Bi-214 by GEA	SOLID	LA-508-462	U	-1.75	pCi/g		34	06/13/03	05/30/03	06/03/03

0000171

MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
U - Analyzed for but not detected above limiting criteria.
J - Estimated Value

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report W004/ver. 5.1
Ground Water Protection Program

WSCF
ANALYTICAL RESULTS REPORT

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Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	7439-96-5	Manganese by ICP-MS	SOLID	LA-505-412		139	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7439-97-6	Mercury by ICP-MS	SOLID	LA-505-412		1.31	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7439-98-7	Molybdenum by ICP-MS	SOLID	LA-505-412	U	< 1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-02-0	Nickel by ICP-MS	SOLID	LA-505-412		5.48	ug/g	4.73	2.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7782-49-2	Selenium by ICP-MS	SOLID	LA-505-412	U	< 1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-22-4	Silver by ICP-MS	SOLID	LA-505-412	EU	< 0.946	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-28-0	Thallium by ICP-MS	SOLID	LA-505-412	U	< 0.473	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-29-1	Thorium by ICP-MS	SOLID	LA-505-412		3.46	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-61-1	Uranium by ICP-MS	SOLID	LA-505-412		28.0	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-62-2	Vanadium by ICP-MS	SOLID	LA-505-412		45.4	ug/g	4.73	1.9	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-66-6	Zinc by ICP-MS	SOLID	LA-505-412		25.4	ug/g	4.73	19	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	TPH-G	Total Pet. Hydrocarbons Gas	SOLID	NWTPH	U	< 500	ug/kg		5.0e+02	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	12674-11-2	Aroclor-1016	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11104-28-2	Aroclor-1221	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11141-16-5	Aroclor-1232	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	53469-21-9	Aroclor-1242	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	12672-29-6	Aroclor-1248	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11097-69-1	Aroclor-1254	SOLID	LA-523-427	J	140	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11096-82-5	Aroclor-1260	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	37324-23-5	Aroclor-1262	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11100-14-4	Aroclor-1268	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	13981-16-3	Pu-238 by AEA	SOLID	LA-508-471	U	-0.120	pCi/g		0.32	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Pu-238 by AEA Total Cntg Error	SOLID	LA-508-471		140	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOLID	LA-508-471		21.0	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	PU-239/240	Pu-239/240 by AEA	SOLID	LA-508-471		3.90	pCi/g		0.077	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	120-82-1	1,2,4-Trichlorobenzene	SOLID	LA-523-456	U	< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	95-50-1	1,2-Dichlorobenzene (SV)	SOLID	LA-523-456	U	< 1.90e+03	ug/kg	1.00	1.9e+03	06/09/03	05/30/03	06/03/03

0001212

MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
U - Analyzed for but not detected above limiting criteria.
J - Estimated Value

DF=Dilution Factor

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Report W004/ver. 5.1
Ground Water Protection Program

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	91-20-3	Naphthalene	SOLID	LA-523-456	U	< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	98-95-3	Nitrobenzene	SOLID	LA-523-456	U	< 1.40e+03	ug/kg	1.00	1.4e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	87-86-5	Pentachlorophenol	SOLID	LA-523-456	U	< 1.60e+03	ug/kg	1.00	1.6e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	85-01-8	Phenanthrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-95-2	Phenol	SOLID	LA-523-456	U	< 520	ug/kg	1.00	5.2e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	129-00-0	Pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	111-44-4	bis(-2-Chloroethyl)Eth	SOLID	LA-523-456	U	< 1.30e+03	ug/kg	1.00	1.3e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	111-91-1	bis(2-Chloroethoxy)methane	SOLID	LA-523-456	U	< 590	ug/kg	1.00	5.9e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	13966-29-5	U-234 by AEA	SOLID	LA-508-471		4.70	pCi/g		0.063	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-234 by AEA Total Cntg Error	SOLID	LA-508-471		27.0	%		0.0	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	15117-96-1	U-235 by AEA	SOLID	LA-508-471		0.260	pCi/g		0.089	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-235 by AEA Total Cntg Error	SOLID	LA-508-471		47.0	%		0.0	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	24678-82-8	U-238 by AEA	SOLID	LA-508-471		4.70	pCi/g		0.023	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-238 by AEA Total Cntg Error	SOLID	LA-508-471		27.0	%		0.10	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	71-55-6	1,1,1-Trichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	79-00-5	1,1,2-Trichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-34-3	1,1-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-35-4	1,1-Dichloroethene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	107-06-2	1,2-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	540-59-0	1,2-Dichloroethene (cis & tran	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	78-87-5	1,2-Dichloropropane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	78-93-3	2-Butanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	591-78-6	2-Hexanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-10-1	4-Methyl-2-pentanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	67-64-1	Acetone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	71-43-2	Benzene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03

MDL=Minimum Detection Limit E - Analyte is an estimate, has potentially larger errors J - Estimated Value
RQ=Result Qualifier U - Analyzed for but not detected above limiting criteria.

DF=Dilution Factor

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Report W004/ver. 5.1
Ground Water Protection Program

WSCF
ANALYTICAL RESULTS REPORT

2 - 20

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20031183

Sample #	Client ID	CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000753	B16WB2 DUP 20030642	15092-94-1	Lead-212	SOIL	LA-508-462		0.511	pCi/g	1.00	0.021	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Pb-212 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 0.0511	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	14733-03-0	Bismuth-214	SOIL	LA-508-462		0.372	pCi/g	1.00	0.021	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Bi-214 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 0.0547	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	15067-28-4	Lead-214	SOIL	LA-508-462		0.430	pCi/g	1.00	0.022	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Pb-214 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 0.0482	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	14331-83-0	Actinium-228	SOIL	LA-508-462		0.524	pCi/g	1.00	0.037	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Ac-228 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 0.0770	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	15065-10-8	Thorium-234	SOIL	LA-508-462	U	0.481	pCi/g	1.00	0.71	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Th-234 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 0.232	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	15117-96-1	Uranium-235	SOIL	LA-508-462	U	0.0511	pCi/g	1.00	0.086	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	U-235 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 0.0191	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	14596-10-2	Americium-241	SOIL	LA-508-462	U	0.0157	pCi/g	1.00	0.086	09/09/03	n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Am-241 Rel Count Error (GEA)	SOIL	LA-508-462		+- 0.0491	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	10198-40-0	Cobalt-60	SOIL	LA-508-462	U	-0.188	pCi/g	1.00	4.8	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Co-60 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 1.88	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	14234-35-6	Antimony-125	SOIL	LA-508-462	U	-20.9	pCi/g	1.00	71	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Sb-125 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 43.9	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	13967-70-9	Cesium-134	SOIL	LA-508-462	U	-2.33	pCi/g	1.00	14	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Cs-134 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 8.67	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	10045-97-3	Cesium-137	SOIL	LA-508-462		6.19e+04	pCi/g	1.00	22	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Cs-137 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 7.92e+03	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	14683-23-9	Europium-152	SOIL	LA-508-462	U	-20.2	pCi/g	1.00	62	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Eu-152 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 38.0	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	15585-10-1	Europium-154	SOIL	LA-508-462	U	-3.16	pCi/g	1.00	25	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Eu-154 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 15.4	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	14391-16-3	Europium-155	SOIL	LA-508-462		34.9	pCi/g	1.00	55	09/09/03	n/a	08/27/03

0014000

MDL=Minimum Detection Limit U - Analyzed for but not detected above limiting criteria.
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Report WGPP/ver. 1
Ground Water Protection Program

WSCF
ANALYTICAL RESULTS REPORT

2 - 21

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20031183

Sample #	Client ID			CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000754	B171B9	DUP	20030757	E,T,C	Eu-155 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 33.7	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	15832-50-5	Tin-126	SOIL	LA-508-462	U	10.4	pCi/g	1.00	11	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Sn-126 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 22.3	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	15262-20-1	Radium-228	SOIL	LA-508-462	U	2.23	pCi/g	1.00	39	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Ra-228 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 22.3	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	13982-63-3	Radium-226	SOIL	LA-508-462	U	7.12 J	pCi/g	1.00	32	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Ra-226 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 19.4	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	13982-39-3	Zinc-65	SOIL	LA-508-462	U	6.25	pCi/g	1.00	20	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Zn-65 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 12.1	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	14681-63-1	Niobium-94	SOIL	LA-508-462	U	0.916	pCi/g	1.00	14	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Nb-94 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 8.25	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	13968-53-1	Ruthenium-103	SOIL	LA-508-462	U	-2.03	pCi/g	1.00	24	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Ru-103 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 14.6	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	13967-48-1	Ruthenium-106	SOIL	LA-508-462	U	-16.1	pCi/g	1.00	1.5e+02	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Ru-106 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 91.8	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	13966-06-8	Tin-113	SOIL	LA-508-462	U	6.99	pCi/g	1.00	30	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Sn-113 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 18.2	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	14762-78-8	Cerium-144	SOIL	LA-508-462	U	49.2	pCi/g	1.00	1.1e+02	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Ce-144 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 65.4	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	14913-50-9	Thallium-208	SOIL	LA-508-462	U	2.95 J	pCi/g	1.00	18	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Tl-208 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 10.5	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	14913-49-6	Bismuth-212	SOIL	LA-508-462	U	-6.32	pCi/g	1.00	1.1e+02	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Bi-212 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 63.2	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	15092-94-1	Lead-212	SOIL	LA-508-462	U	15.5	pCi/g	1.00	34	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Pb-212 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 20.8	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	14733-03-0	Bismuth-214	SOIL	LA-508-462	U	7.12 J	pCi/g	1.00	32	09/09/03	n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Bi-214 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 19.4	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03

0100075

MDL=Minimum Detection Limit U - Analyzed for but not detected above limiting criteria.
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10/8/03

WSCF
ANALYTICAL RESULTS REPORT

2 - 22

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20031183

Sample #	Client ID	CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000754	B171B9 DUP 20030757	15067-28-4	Lead-214	SOIL	LA-508-462	U	-8.19	pCi/g	1.00	46	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Pb-214 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 28.0	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	14331-83-0	Actinium-228	SOIL	LA-508-462	U	2.23	pCi/g	1.00	39	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Ac-228 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 22.3	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	15065-10-8	Thorium-234	SOIL	LA-508-462	U	148	pCi/g	1.00	6.8e+02	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Th-234 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 407	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	15117-96-1	Uranium-235	SOIL	LA-508-462	U	65.4	pCi/g	1.00	1.1e+02	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	U-235 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 67.4	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	14596-10-2	Americium-241	SOIL	LA-508-462	U	-44.6	pCi/g	1.00	89	09/09/03	n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Am-241 Rel Count Error (GEA)	SOIL	LA-508-462		+- 53.5	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	10198-40-0	Cobalt-60	SOIL	LA-508-462	U	-0.146	pCi/g	1.00	0.30	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Co-60 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 0.204	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	14234-35-6	Antimony-125	SOIL	LA-508-462	U	2.81	pCi/g	1.00	15	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Sb-125 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 8.88	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	13967-70-9	Cesium-134	SOIL	LA-508-462	U	0.224	pCi/g	1.00	0.93	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Cs-134 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 0.488	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	10045-97-3	Cesium-137	SOIL	LA-508-462		3.08e+03	pCi/g	1.00	3.5	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Cs-137 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 422	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	14683-23-9	Europium-152	SOIL	LA-508-462	U	-5.20	pCi/g	1.00	12	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Eu-152 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 7.18	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	15585-10-1	Europium-154	SOIL	LA-508-462	U	0.143	pCi/g	1.00	2.2	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Eu-154 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 1.15	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	14391-16-3	Europium-155	SOIL	LA-508-462	U	-2.36	pCi/g	1.00	8.8	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Eu-155 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 5.31	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	15832-50-5	Tin-126	SOIL	LA-508-462	U	3.45	pCi/g	1.00	4.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Sn-126 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 3.62	pCi/g	1.00	0.0	09/09/03	n/a	08/27/03
W030000755	B171C0 DUP 20030757	15262-20-1	Radium-228	SOIL	LA-508-462	U	1.00	pCi/g	1.00	2.9	09/09/03	n/a	08/27/03

MDL=Minimum Detection Limit U - Analyzed for but not detected above limiting criteria.
RQ=Result Qualifier

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1
Ground Water Protection Program

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	**WSCF20030757**
Sample Matrix	**Soil**
Sample Visual	**Brown**
SAF Number	**F03-006**
Data Deliverable	**Summary Report**

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Protection Program- Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.
- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.
- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale
WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline
Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

Customer Sample Number	Original Sample Delivery Group
B16W93	WSCF20030588
B16W94	WSCF20030588
B16W95	WSCF20030588
B16W96	WSCF20030598
B16W97	WSCF20030598
B16W98	WSCF20030598
B16W99	WSCF20030613
B16WB0	WSCF20030613
B16WB1	WSCF20030630
B16WB2	WSCF20030642
~~B16WC0~~	~~WSCF20030567~~
B171B9	WSCF20030757
B171C0	WSCF20030757
B171C1	WSCF20030757
B17216	WSCF20030757
B17217	WSCF20030757
B17218	WSCF20030757

Included in WSCF2003182
Dayes
9/23/03

Introduction

GPP requested WSCF to rerun the above samples to include QC data for the GEA test. These samples were analyzed in accordance with the *Groundwater Protection Program- Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the client correspondence are included as Attachment 3.

Analytical Methodology for Requested Analyses

- The GEA analysis was run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved method.

Comments

RadChem – There are no hold times associated with this WDOE accredited method. A Laboratory Control Sample, Blank and Duplicate (per agreement with the client, the duplicate is a recount of one the samples in the batch) were analyzed with this assigned delivery group. See page(s) 2-37, and 2-38 for QC details. The upper and lower limits for the BLANK (page 2-38) have been established as starting points for the GEA analysis. As more analyses are run, these limits will be adjusted.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale
WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline
Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-144	Page 1 of 1
Collector Johansen/Pope/Pfister	Company Contact LC Hulstrom	Telephone No. 373-3928	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 60 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location ~~ms 6-29-03~~ 216-B-12 (C3246); ~~(32'-35')~~ ~~30-32.5~~ (35.5-38')	SAF No. F03-006	Air Quality ☐
Ice Chest No.	Field Logbook No. HNF-N-3361	COA 117504ES10	Method of Shipment Government Vehicle
Shipped To 222-S Lab Operations WSCF KT 6/3/03	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A

POSSIBLE SAMPLE HAZARDS/REMARKS												
Special Handling and/or Storage 76030757	Preservation	Cool 4C	Cool 4C	None	None							
	Type of Container	aG	aG	aG	aG							
	No. of Container(s)	2	1	2 rpc-30-03	1							
	Volume	40mL	40mL	~~120mL~~ 60mL	60mL							
SAMPLE ANALYSIS		VOA - 8260A - Complete	Semi-VOA - 8270A (TCL); PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.							
		STL	STL	W	E							

Sample No.	Matrix *	Sample Date	Sample Time										
B171B9 W030000533	SOIL	5-30-03	1140								B171P0		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	5-30-03 1445	H0-64-4277 Ref	5-30-03 1445
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
H0-64-4277 Ref	6/03/03 1315	Greg Thomas Greg Thomas	1315 6/03/03
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas Greg Thomas	1400 6/03/03	[illegible]	1450 6/3/03
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

**The laboratory is to report both kerosene and diesel range compounds from WTPH-D analysis.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Antimony-125, Cesium-134, Radium-226, Radium-228, Tin-126}; Isotopic Plutonium; Americium-241; Isotopic Uranium; Total Uranium; ICP Metals - 6010A (SW-846) {Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Boron, Lead, Selenium}; Mercury ~~- 7471 - (CV)~~; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate}; Total Cyanide - 9010; Ammonia - 350.1; pH (Soil) - 9045

~~(2) Technetium-99; Strontium-89,90 - Sr-90; Isotopic Thorium {Thorium-232}; Neptunium-237; Iodine-129~~

WTPH-D & WTPH-G / MAM 06-05-03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

#1 - 200.8 & 6010 / MAM 06-05-03

0000023

3-14

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-PW-2/200-PW-4			DATA PACKAGE: WSCF 20030757		
VALIDATOR: TLT		LAB: WSCF		DATE: 10/18/03	
CASE:			SDG: 30757		

ANALYSES PERFORMED

Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			

SAMPLES/MATRIX

B17189

Soil

1. Completeness ..... ☒ N/A

Technical verification forms present? ..... Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Appendix A – Radiochemical Data Validation Checklist

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E) ..... ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A
Method blank results acceptable? ..... Yes No N/A
Analytes detected in method blank? ..... Yes No N/A
Field blank(s) analyzed? ..... Yes No N/A
Field blank results acceptable? ..... Yes No N/A
Analytes detected in field blank(s)? ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A
Comments: NO FBs

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A
LCS/BSS recoveries acceptable? ..... Yes No N/A
LCS/BSS traceable? (Levels D,E) ..... Yes No N/A
LCS/BSS expired? (Levels D,E) ..... Yes No N/A
LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A
Comments:

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☐ N/A

Chemical carrier added? ..... Yes No N/A
Chemical recovery acceptable? ..... Yes No N/A
Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E) ..... ☒ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

10. Duplicates (Levels C, D, E) ☐ N/A

Duplicates Analyzed at required frequency? Yes No N/A
RPD Values Acceptable? Yes No N/A
Transcription/Calculation Errors? (Levels D, E) Yes No N/A
Comments: ~~Uranium RPD 40%~~ K 10/18

Bismuth 214 60
lead 214 48
radium 226 60
thallium 204 44

11. Field QC Samples (Levels C, D E) ☐ N/A

Field duplicate sample(s) analyzed? Yes No N/A
Field duplicate RPD values acceptable? Yes No N/A
Field split sample(s) analyzed? Yes No N/A
Field split RPD values acceptable? Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable? Yes No N/A
Comments:

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A
Comments:

Appendix A – Radiochemical Data Validation Checklist

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses?	(Yes)	No	N/A
Results supported in raw data?(Levels D, E)	Yes	No	(N/A)
Results Acceptable? (Levels D, E)	Yes	No	(N/A)
Transcription/Calculation errors? (Levels D, E)	Yes	No	(N/A)
MDA's meet required detection limits?	Yes	(No)	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: 2 out

Appendix 6

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: Uranium Isotopics by AEA

SAF Number: F03-006
Sample Date: 06/03/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit	
Lab ID: W030000531								
BATCH QC ASSOCIATED WITH SAMPLE								
DUP	U-238 by AEA	24678-82-8	40.000	RPD	06/16/03	0.000	20.000	*
BATCH QC								
BLANK	U-238 by AEA	24678-82-8	9.0e-03	PCG	06/16/03	0.000	1000.000	
LCS	U-238 by AEA	24678-82-8	109.000	% Recov	06/16/03	75.000	125.000	

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: Americium by AEA

SAF Number: F03-006
Sample Date: 06/03/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000531							
BATCH QC ASSOCIATED WITH SAMPLE							
DUP	Am-241 by AEA	14596-10-2	123.529	RPD	06/18/03	0.000	20.000 *
BATCH QC							
BLANK	Am-241 by AEA	14596-10-2	3.4e-02	PCG	06/18/03	0.000	1000.000
LCS	Am-241 by AEA	14596-10-2	103.000	% Recov	06/18/03	75.000	125.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: Plutonium Isotopics by AEA

SAF Number: F03-006
Sample Date: 06/03/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000531							
BATCH QC ASSOCIATED WITH SAMPLE							
DUP	Pu-239/240 by AEA	PU-239/240	79.476	RPD	06/17/03	0.000	20.000
BATCH QC							
BLANK	Pu-239/240 by AEA	PU-239/240	6.4e-02	PCG	06/17/03	0.000	1000.000
LCS	Pu-239/240 by AEA	PU-239/240	98.000	% Recov	06/17/03	75.000	125.000

WSCF ANALYTICAL LABORATORY QC REPORT

2-37

SDG Number: WSCF20031183
Matrix: SOLID
Test: Gamma Energy Analysis-grd H2O

SAF Number: F03-006
Sample Date:
Receive Date:08/27/03

Lab ID: W030000759
BATCH QC ASSOCIATED WITH SAMPLE

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
DUP	Actinium-228	14331-83-0	8.17e-01	22.101	RPD	09/09/03	0.000	20.000	*
DUP	Americium-241	14596-10-2	U-3.89e-1	n/a	RPD	09/09/03	0.000	20.000	
DUP	Bismuth-212	14913-49-6	7.34e-01	n/a	RPD	09/09/03	0.000	20.000	
DUP	Bismuth-214	14733-03-0	5.62e-01	60.546	RPD	09/09/03	0.000	20.000	*
DUP	Cerium-144	14762-78-8	U-1.53e-1	n/a	RPD	09/09/03	0.000	20.000	
DUP	Cobalt-60	10198-40-0	U-4.86e-2	n/a	RPD	09/09/03	0.000	20.000	
DUP	Cesium-134	13967-70-9	U5.30e-02	n/a	RPD	09/09/03	0.000	20.000	
DUP	Cesium-137	10045-97-3	U6.62e-03	n/a	RPD	09/09/03	0.000	20.000	
DUP	Europium-152	14683-23-9	U8.52e-02	n/a	RPD	09/09/03	0.000	20.000	
DUP	Europium-154	15585-10-1	U-2.58e-3	n/a	RPD	09/09/03	0.000	20.000	
DUP	Europium-155	14391-16-3	U-8.81e-2	n/a	RPD	09/09/03	0.000	20.000	
DUP	Niobium-94	14681-63-1	U8.34e-03	n/a	RPD	09/09/03	0.000	20.000	
DUP	Lead-212	15092-94-1	6.76e-01	6.026	RPD	09/09/03	0.000	20.000	
DUP	Lead-214	15067-28-4	6.61e-01	48.133	RPD	09/09/03	0.000	20.000	*
DUP	Radium-226	13982-63-3	5.62e-01	60.546	RPD	09/09/03	0.000	20.000	*
DUP	Radium-228	15262-20-1	8.17e-01	22.101	RPD	09/09/03	0.000	20.000	*
DUP	Ruthenium-103	13968-53-1	U1.97e-02	n/a	RPD	09/09/03	0.000	20.000	
DUP	Ruthenium-106	13967-48-1	U1.39e-01	n/a	RPD	09/09/03	0.000	20.000	
DUP	Antimony-125	14234-35-6	U-5.57e-2	n/a	RPD	09/09/03	0.000	20.000	
DUP	Tin-113	13966-06-8	U-1.87e-2	n/a	RPD	09/09/03	0.000	20.000	
DUP	Tin-126	15832-50-5	U1.07e-01	n/a	RPD	09/09/03	0.000	20.000	
DUP	Thorium-234	15065-10-8	U2.12e+00	n/a	RPD	09/09/03	0.000	20.000	
DUP	Thallium-208	14913-50-9	1.87e-01	44.813	RPD	09/09/03	0.000	20.000	*
DUP	Uranium-235	15117-96-1	U1.20e-01	n/a	RPD	09/09/03	0.000	20.000	
DUP	Zinc-65	13982-39-3	U3.96e-02	n/a	RPD	09/09/03	0.000	20.000	

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WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20031183
Matrix: SOLID
Test: Gamma Energy Analysis-grd H2O

SAF Number: F03-006
Sample Date:
Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
BATCH QC									
BLANK	Actinium-228	14331-83-0	U-9.34e-2	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Americium-241	14596-10-2	U-1.80e0	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Bismuth-212	14913-49-6	U5.75e-01	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Bismuth-214	14733-03-0	4.64e-01	0.464	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Cerium-144	14762-78-8	U-4.77e-1	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Cobalt-60	10198-40-0	U2.25e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Cesium-134	13967-70-9	U-4.04e-2	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Cesium-137	10045-97-3	U5.89e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Europium-152	14683-23-9	U5.04e-03	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Europium-154	15585-10-1	U-1.75e-1	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Europium-155	14391-16-3	U1.87e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Niobium-94	14681-63-1	U4.18e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Lead-212	15092-94-1	U2.20e-01	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Lead-214	15067-28-4	6.14e-01	0.614	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Radium-226	13982-63-3	4.64e-01	0.464	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Radium-228	15262-20-1	U-9.34e-2	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Ruthenium-103	13968-53-1	U2.10e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Ruthenium-106	13967-48-1	U5.33e-01	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Antimony-125	14234-35-6	U-3.84e-2	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Tin-113	13966-06-8	U1.97e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Tin-126	15832-50-5	U-2.26e0	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Thorium-234	15065-10-8	U-4.43e0	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Thallium-208	14913-50-9	U1.33e-01	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Uranium-235	15117-96-1	U-8.14e-1	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Zinc-65	13982-39-3	U-2.42e-1	n/a	pCi/g	09/15/03	-10000.000	1000.000	
LCS	Americium-241	14596-10-2	3.92e+03	100.000	% Recov	09/05/03	80.000	120.000	
LCS	Cobalt-60	10198-40-0	4.14e+03	98.807	% Recov	09/05/03	80.000	120.000	
LCS	Cesium-137	10045-97-3	3.73e+03	104.180	% Recov	09/05/03	80.000	120.000	

Date: 17 November 2003
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU Borehole Soil Sampling
Subject: PCBs - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 30757 prepared by WSCF. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	C	PCBs by 8082

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev.1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by the Client

DATA QUALITY OBJECTIVES

- **Holding Times/Sample Preservation**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected

sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than practical quantitation limit (PQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than PQL, the result is qualified as undetected and elevated to the PQL.

All method blank target compound results were acceptable.

Field Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Blank Spike

Matrix spike and blank spike analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations and is done in duplicate. Matrix spike and blank spike analyses must be within control limits of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All blank spike results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the

unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the target quantitation limits to ensure that laboratory detection levels meet the required criteria. All undetected results exceeded the analyte specific TQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data Package No. 30757 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All undetected results exceeded the analyte specific TQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PESTICIDE DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: FLUOR-HANFORD							
Laboratory: WSCF							
Case:	SDG: WSCF20030757						
Sample Number		B171B9					
Remarks							
Sample Date		5/30/02					
Analysis Date		6/13/03					
PCB	RDL	Result	Q	Result	Q	Result	Q
Aroclor-1016	16.5	<110	U				
Aroclor-1221	16.5	<110	U				
Aroclor-1232	16.5	<110	U				
Aroclor-1242	16.5	<110	U				
Aroclor-1248	16.5	<110	U				
Aroclor-1254	16.5	140					
Aroclor-1260	16.5	<110	U				
Arolcor-1262	16.5	<110	U				
Aroclor-1268	16.5	<110	U				

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation. NA - Not analyzed

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	7439-96-5	Manganese by ICP-MS	SOLID	LA-505-412		139	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7439-97-6	Mercury by ICP-MS	SOLID	LA-505-412		1.31	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7439-98-7	Molybdenum by ICP-MS	SOLID	LA-505-412	U	< 1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-02-0	Nickel by ICP-MS	SOLID	LA-505-412		5.48	ug/g	4.73	2.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7782-49-2	Selenium by ICP-MS	SOLID	LA-505-412	U	< 1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-22-4	Silver by ICP-MS	SOLID	LA-505-412	EU	< 0.946	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-28-0	Thallium by ICP-MS	SOLID	LA-505-412	U	< 0.473	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-29-1	Thorium by ICP-MS	SOLID	LA-505-412		3.46	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-61-1	Uranium by ICP-MS	SOLID	LA-505-412		28.0	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-62-2	Vanadium by ICP-MS	SOLID	LA-505-412		45.4	ug/g	4.73	1.9	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-66-6	Zinc by ICP-MS	SOLID	LA-505-412		25.4	ug/g	4.73	19	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	TPH-G	Total Pet. Hydrocarbons Gas	SOLID	NWTPH	U	< 500	ug/kg		5.0e+02	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	12674-11-2	Aroclor-1016	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11104-28-2	Aroclor-1221	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11141-16-5	Aroclor-1232	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	53469-21-9	Aroclor-1242	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	12672-29-6	Aroclor-1248	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11097-69-1	Aroclor-1254	SOLID	LA-523-427	J	140	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11096-82-5	Aroclor-1260	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	37324-23-5	Aroclor-1262	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11100-14-4	Aroclor-1268	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	13981-16-3	Pu-238 by AEA	SOLID	LA-508-471	U	-0.120	pCi/g		0.32	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Pu-238 by AEA Total Cntg Error	SOLID	LA-508-471		140	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOLID	LA-508-471		21.0	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	PU-239/240	Pu-239/240 by AEA	SOLID	LA-508-471		3.90	pCi/g		0.077	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	120-82-1	1,2,4-Trichlorobenzene	SOLID	LA-523-456	U	< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	95-50-1	1,2-Dichlorobenzene (SV)	SOLID	LA-523-456	U	< 1.90e+03	ug/kg	1.00	1.9e+03	06/09/03	05/30/03	06/03/03

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MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
U - Analyzed for but not detected above limiting criteria.
J - Estimated Value

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

10/16/03

Report W004/ver. 5.1
Ground Water Protection Program

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	**WSCF20030757**
Sample Matrix	**Soil**
Sample Visual	**Brown**
SAF Number	**F03-006**
Data Deliverable	**Summary Report**

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Protection Program- Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.

- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.

- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.

- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale
WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline
Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-144	Page 1 of 1
Collector Johansen/Pope/Pfister	Company Contact LC Hulstrom Telephone No. 373-3928	Project Coordinator TRENT, SJ	Price Code 8N Data Turnaround 60 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location ~~MS 6-24-03~~ 216-B-12 (C3246); ~~(32'-35')~~ ~~30-32.5~~ (35.5-38')	SAF No. F03-006	Air Quality ☐
Ice Chest No.	Field Logbook No. HNF-N-3361 COA 117504ES10	Method of Shipment Government Vehicle	
Shipped To 222-S Lab Operations WSCF LT 6/3/03	Offsite Property No. N/A	Bill of Lading/Air Bill No. N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	None						
Special Handling and/or Storage 70030757	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	2	1	2 ~~30-30-03~~	1						
	Volume	40mL	40mL	~~120mL~~ 60mL	60mL						
SAMPLE ANALYSIS		VOA - 8260A - Complete	Semi-VOA - 8270A (TCL); PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						
		STL	STL	W	E						

Sample No.	Matrix *	Sample Date	Sample Time									
B171B9 W030000533	SOIL	5-30-03	1140							B171P2		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From [illegible] 5-30-03 1145	Date/Time	Received By/Stored In HO-64-4277 Ref 5-30-03 1145	Date/Time
Relinquished By/Removed From HO-64-4277 Ref 6/03/03 1315	Date/Time	Received By/Stored In Greg Thomas Greg Thomas 6/03/03	Date/Time 1315
Relinquished By/Removed From Greg Thomas Greg Thomas 6/03/03	Date/Time 1400	Received By/Stored In [signature] [signature] 6/3/03	Date/Time 1400
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

**The laboratory is to report both kerosene and diesel range compounds from WTPH-D analysis.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Antimony-125, Cesium-134, Radium-226, Radium-228, Tin-126}; Isotopic Plutonium; Americium-241; Isotopic Uranium; Total Uranium; ICP Metals - 6010A (SW-846) {Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Boron, Lead, Selenium}; Mercury ~~- 7471 - (CV);~~ IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate}; Total Cyanide - 9010; Ammonia - 350.1; pH (Soil) - 9045

~~(2) Technetium-99; Strontium-89,90 - Sr-90; Isotopic Thorium {Thorium-232}; Neptunium-237; Iodine-129~~

WTPH-D & WTPH-G / MAM 06-05-03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

#1 - 200.8 & 6010 / MAM 06-05-03

0000016

3-14

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-PW-2 / 200-PW-4			DATA PACKAGE: WSCF20030757		
VALIDATOR: TLI		LAB: WSCF		DATE: 10/18/03	
CASE:			SDG: 30757		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
B171B9					
					soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments: _____

PESTICIDE/PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? (Yes) No N/A
Duplicate results acceptable? (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No (N/A)
MS/MSD standards expired? (Levels D, E) Yes No (N/A)
Field duplicate RPD values acceptable? Yes (No) N/A
Field split RPD values acceptable? Yes No (N/A)
Transcription/calculation errors? (Levels D, E) Yes No (N/A)
Comments: NO FB

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? Yes No (N/A)
Positive results resolved acceptably? Yes No (N/A)
Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? (Yes) No N/A
Sample holding times acceptable? (Yes) No N/A
Comments:

PESTICIDE/PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: _____

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... (Yes) No N/A
Surrogate recoveries acceptable? ..... (Yes) No N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: NO PAS

PESTICIDE/PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A
Results reported for all requested analyses? ..... Yes No N/A
Rresults supported in the raw data? (Levels D, E) ..... Yes No N/A
Samples properly prepared? (Levels D, E) ..... Yes No N/A
Detection limits meet RDL? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: all undetects ok

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A
Lot check performed? ..... Yes No N/A
Check recoveries aceptable? ..... Yes No N/A
GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries aceptable? ..... Yes No N/A
GPC calibration performed? ..... Yes No N/A
GPC calibration check performed? ..... Yes No N/A
GPC calibration check retention times acceptable? ..... Yes No N/A
Check/calibration materials traceable? ..... Yes No N/A
Check/calibration materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: PCBs complete list

SAF Number: F03-006
Sample Date: 05/30/03
Receive Date: 06/03/03

QC Type	Analyte		CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000532								
BATCH QC ASSOCIATED WITH SAMPLE								
MS	Aroclor-1260		11096-82-5	111.000	% Recov	06/13/03	75.000	125.000
MS	Decachlorobiphenyl	Surr	2051-24-3	115.000	% Recov	06/13/03	50.000	150.000
MS	Tetrachloro-m-xylene	Surr	877-09-8	95.000	% Recov	06/13/03	50.000	150.000
MSD	Aroclor-1260		11096-82-5	96.400	% Recov	06/13/03	75.000	125.000
MSD	Decachlorobiphenyl	Surr	2051-24-3	120.000	% Recov	06/13/03	50.000	150.000
MSD	Tetrachloro-m-xylene	Surr	877-09-8	87.600	% Recov	06/13/03	50.000	150.000
SPK-RPD	Aroclor-1260		11096-82-5	14.079	RPD	06/13/03	0.000	25.000
SPK-RPD	Decachlorobiphenyl	Surr	2051-24-3	4.255	RPD	06/13/03	0.000	20.000
SPK-RPD	Tetrachloro-m-xylene	Surr	877-09-8	8.105	RPD	06/13/03	0.000	20.000
SURR	Decachlorobiphenyl	Surr	2051-24-3	127.000	% Recov	06/13/03	50.000	150.000
SURR	Tetrachloro-m-xylene	Surr	877-09-8	106.000	% Recov	06/13/03	50.000	150.000
Lab ID: W030000533								
BATCH QC ASSOCIATED WITH SAMPLE								
SURR	Decachlorobiphenyl	Surr	2051-24-3	127.000	% Recov	06/13/03	50.000	150.000
SURR	Tetrachloro-m-xylene	Surr	877-09-8	102.000	% Recov	06/13/03	50.000	150.000
BATCH QC								
BLANK	Aroclor-1016		12674-11-2	< 100	ug/Kg	06/13/03		
BLANK	Aroclor-1221		11104-28-2	< 100	ug/Kg	06/13/03		
BLANK	Aroclor-1232		11141-16-5	< 100	ug/Kg	06/13/03		
BLANK	Aroclor-1242		53469-21-9	< 100	ug/Kg	06/13/03		
BLANK	Aroclor-1248		12672-29-6	< 100	ug/Kg	06/13/03		
BLANK	Aroclor-1254		11097-69-1	< 100	ug/Kg	06/13/03		
BLANK	Aroclor-1260		11096-82-5	< 100	ug/Kg	06/13/03		
BLANK	Aroclor-1262		37324-23-5	< 100	ug/Kg	06/13/03		
BLANK	Aroclor-1268		11100-14-4	< 100	ug/Kg	06/13/03		
BLANK	Decachlorobiphenyl	Surr	2051-24-3	120.000	% Recov	06/13/03	50.000	150.000
BLANK	Tetrachloro-m-xylene	Surr	877-09-8	80.300	% Recov	06/13/03	50.000	150.000
LCS	Aroclor-1260		11096-82-5	115.000	% Recov	06/13/03	70.000	130.000
LCS	Decachlorobiphenyl	Surr	2051-24-3	117.000	% Recov	06/13/03	50.000	150.000
LCS	Tetrachloro-m-xylene	Surr	877-09-8	103.000	% Recov	06/13/03	50.000	150.000

Date: 17 November 2003
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Subject: Volatiles - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. 30757 prepared by WSCF. A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	C	See note 1

1 - Volatiles by EPA 8260A.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times/Sample Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Preserved water samples must be analyzed within: 14 days of the date of sample collection for VOAs. If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the project quantitation limit (MDL) and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the MDL, qualified as undetected and flagged "U".

All method blank results were acceptable.

Field Blanks

No field duplicate samples were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate are used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within 70-130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All MS/MSD and blank spike results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Sample results must be within RPD limits of +/- 35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Limits**

Reported analytical detection levels are compared against the target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. Twelve analytes exceeded the analyte specific TQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data package No. 30757 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Twelve analytes exceeded the analyte specific TQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

VOLATILE DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

VOLATILE ORGANIC AND ALCOHOL/GLYCOL ANALYSIS, WATER MATRIX, (UG/KG)

Project: BECHTEL-HANFORD									
Laboratory: WSCF									
Case:	SDG: WSCF20030757								
Sample Number		B171B9							
Remarks									
Sample Date		05/30/03							
Analysis Date		06/12/03							
VOA/Alcohols	TQL	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1-Trichloroethane	5	<21.0	U						
1,1,2,2-Tetrachloroethane*		<21.0	U						
1,1,2-Trichloroethane		<21.0	U						
1,1-Dichloroethane*	10	<21.0	U						
1,1-Dichloroethene*	5	<21.0	U						
1,2-Dichloroethane		<21.0	U						
1,2-Dichloroethene (cis & trans)		<21.0	U						
1,2-Dichloropropane		<21.0	U						
2-Butanone*	10	<21.0	U						
2-Hexanone		<21.0	U						
4-Methyl-2-pentanone		<21.0	U						
Acetone		<21.0	U						
Benzene*	5	<21.0	U						
Bromodichloromethane		<21.0	U						
Bromoform		<21.0	U						
Bromomethane		<21.0	U						
Carbon Disulfide		<21.0	U						
Carbon Terachloride*	5	<21.0	U						
Chlorobenzene*	5	<21.0	U						
Chloroethane		<21.0	U						
Chloroform*	5	<21.0	U						
Chloromethane		<21.0	U						
Dibromochloromethane		<21.0	U						
Ethylbenzene*	5	<21.0	U						
Methylene chloride*	5	1600							
Styrene		<21.0	U						
Tetrachloroethene		<21.0	U						
Toluene*	5	<21.0	U						
Total xylenes*	5	<21.0	U						
Trichloroethene		<21.0	U						
Vinyl chloride		<21.0	U						
cis-1,3-Dichloropropene		<21.0	U						
trans-1,3-Dichloropropene		<21.0	U						
NA = Not analyzed									
* - TQL exceeded									

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize mis-interpretation of results. All other qualifiers shown were applied during validation.

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	91-20-3	Naphthalene	SOLID	LA-523-456	U	< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	98-95-3	Nitrobenzene	SOLID	LA-523-456	U	< 1.40e+03	ug/kg	1.00	1.4e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	87-86-5	Pentachlorophenol	SOLID	LA-523-456	U	< 1.60e+03	ug/kg	1.00	1.6e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	85-01-8	Phenanthrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-95-2	Phenol	SOLID	LA-523-456	U	< 520	ug/kg	1.00	5.2e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	129-00-0	Pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	111-44-4	bis(-2-Chloroethyl)Eth	SOLID	LA-523-456	U	< 1.30e+03	ug/kg	1.00	1.3e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	111-91-1	bis(2-Chloroethoxy)methane	SOLID	LA-523-456	U	< 590	ug/kg	1.00	5.9e+02	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	13966-29-5	U-234 by AEA	SOLID	LA-508-471		4.70	pCi/g		0.063	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-234 by AEA Total Cntg Error	SOLID	LA-508-471		27.0	%		0.0	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	15117-96-1	U-235 by AEA	SOLID	LA-508-471		0.260	pCi/g		0.069	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-235 by AEA Total Cntg Error	SOLID	LA-508-471		47.0	%		0.0	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	24678-82-8	U-238 by AEA	SOLID	LA-508-471		4.70	pCi/g		0.023	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-238 by AEA Total Cntg Error	SOLID	LA-508-471		27.0	%		0.10	06/16/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	71-55-6	1,1,1-Trichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	79-00-5	1,1,2-Trichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-34-3	1,1-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-35-4	1,1-Dichloroethene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	107-06-2	1,2-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	540-59-0	1,2-Dichloroethene (cis & tran	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	78-87-5	1,2-Dichloropropane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	78-93-3	2-Butanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	591-78-6	2-Hexanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-10-1	4-Methyl-2-pentanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	67-64-1	Acetone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	71-43-2	Benzene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03

0000011

MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
U - Analyzed for but not detected above limiting criteria.
J - Estimated Value

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

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WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	75-27-4	Bromodichloromethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-25-2	Bromoform	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	74-83-9	Bromomethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-15-0	Carbon Disulfide	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	56-23-5	Carbon Tetrachloride	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-90-7	Chlorobenzene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-00-3	Chloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	67-66-3	Chloroform	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	74-87-3	Chloromethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	124-48-1	Dibromochloromethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	100-41-4	Ethylbenzene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-09-2	Methylene Chloride	SOLID	LA-523-455		1.60e+03	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	100-42-5	Styrene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	127-18-4	Tetrachloroethene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	108-88-3	Toluene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	1330-20-7	Total Xylenes	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	79-01-6	Trichloroethene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	75-01-4	Vinyl Chloride	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	10061-01-5	cis-1,3-Dichloropropene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	10061-02-6	trans-1,3-Dichloropropene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	TPHKEROSENE	Kerosene	SOLID	NWTPH	U	< 1.60e+04	ug/kg	1.00	1.6e+04	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	68476-34-6	Total Pet. Hydrocarbons Diesel	SOLID	NWTPH	U	< 1.60e+04	ug/kg	1.00	1.6e+04	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	84-15-1	ortho-Terphenyl	SOLID	NWTPH		9.60e+04	ug/kg	1.00	2.1e+03	06/12/03	05/30/03	06/03/03

000012

MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
U - Analyzed for but not detected above limiting criteria.
J - Estimated Value

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

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Ground Water Protection Program

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	**WSCF20030757**
Sample Matrix	**Soil**
Sample Visual	**Brown**
SAF Number	**F03-006**
Data Deliverable	**Summary Report**

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Protection Program- Letter of Instruction,* referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.

- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.

- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.

- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale
WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline
Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-006-144	Page 1 of 1
Collector Johansen/Pope/Pfister	Company Contact LC Hulstrom	Telephone No. 373-3928	Project Coordinator TRENT, SJ	Price Code 8N Data Turnaround 60 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location mß 6-29-03 216-B-12 (C3246); ~~(32'-35')~~ ~~30-32.5~~ (35.5-38')		SAF No. F03-006	Air Quality ☐
Ice Chest No.	Field Logbook No. HNF-N-3361	COA 117504ES10	Method of Shipment Government Vehicle	
Shipped To ~~222-S Lab Operations~~ WSCF KT 6/3/03	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Z0030757

	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10
Preservation	Cool 4C	Cool 4C	None	None						
Type of Container	aG	aG	aG	aG						
No. of Container(s)	2	1	1 mß 5-30-03	1						
Volume	40mL	40mL	~~120mL~~ 60mL	60mL						
SAMPLE ANALYSIS	VOA - 8260A - Complete STL	Semi-VOA - 8270A (TCL); PCBs - 8082 STL	See item (1) in Special Instructions. W	See item (2) in Special Instructions. E			JL TO:			

Sample No.	Matrix *	Sample Date	Sample Time							JL TO:			
B171B9 W030000533	SOIL	5-30-03	1140							B171F0			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	5-30-03 1415	HO-64-4277 Ref	5-30-03 1415
HO-64-4277 Ref	6/03/03 1315	Greg Thomas [signature]	6/3/03 1315
Greg Thomas [signature]	6/03/03 1400	K Bebes [signature]	6/3/03 1400

SPECIAL INSTRUCTIONS

** The laboratory is to report both kerosene and diesel range compounds from WTPH-D analysis.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Antimony-125, Cesium-134, Radium-226, Radium-228, Tin-126}; Isotopic Plutonium; Americium-241; Isotopic Uranium; Total Uranium; ICP Metals - 6010A (SW-846) {Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Boron, Lead, Selenium}; Mercury ~~7471 (CV)~~; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate}; Total Cyanide - 9010; Ammonia - 350.1; pH (Soil) - 9045

~~(2) Technetium-99; Strontium-89,90 - Sr-90; Isotopic Thorium {Thorium-232}; Neptunium-237; Iodine-129~~

WTPH-D & WTPH-G / MAW 06-05-03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

#1 - 200.8 & 6010 / MAW 06-05-03

000017

3-14

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-PW-2/200-PW-4			DATA PACKAGE: WSCF20030757		
VALIDATOR: TLI		LAB: WSCF		DATE: 10/18/03	
CASE:			SDG: 30757		

ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)

SAMPLES/MATRIX
B171B9 ~~B171B9~~ KF 10/18/03
Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E)	Yes	No	(N/A)
Calibration blank results acceptable? (Levels D, E)	Yes	No	(N/A)
Laboratory blanks analyzed?	(Yes)	No	N/A
Laboratory blank results acceptable?	(Yes)	No	N/A
Field/trip blanks analyzed? (Levels C, D, E)	Yes	(No)	N/A
Field/trip blank results acceptable? (Levels C, D, E)	Yes	No	(N/A)
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: NO FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed?	(Yes)	No	N/A
Surrogate/system monitoring compound recoveries acceptable?	(Yes)	No	N/A
Surrogates traceable? (Levels D, E)	Yes	No	(N/A)
Surrogates expired? (Levels D, E)	Yes	No	(N/A)
MS/MSD samples analyzed?	(Yes)	No	N/A
MS/MSD results acceptable?	(Yes)	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	(N/A)
MS/MSD standards? (Levels D, E)	Yes	No	(N/A)
LCS/BSS samples analyzed?	(Yes)	No	N/A
LCS/BSS results acceptable?	(Yes)	No	N/A
Standards traceable? (Levels D, E)	Yes	No	(N/A)
Standards expired? (Levels D, E)	Yes	No	(N/A)
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)
Performance audit sample(s) analyzed?	Yes	(No)	N/A
Performance audit sample results acceptable?	Yes	No	(N/A)

Comments: NO PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD RPD values acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... Yes No (N/A)
Field split RPD values acceptable? ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No (N/A)
Iinternal standard areas acceptable? ..... Yes No (N/A)
Internal standard retention times acceptable? ..... Yes No (N/A)
Standards traceable? ..... Yes No (N/A)
Standards expired? ..... Yes No (N/A)
Transcription/calculation errors? ..... Yes No (N/A)
Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... (Yes) No N/A
Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)	Yes	No	(N/A)
Compound quantitation acceptable? (Levels D, E)	Yes	No	(N/A)
Results reported for all requested analyses?	(Yes)	No	N/A
Rresults supported in the raw data? (Levels D, E)	Yes	No	(N/A)
Samples properly prepared? (Levels D, E)	Yes	No	(N/A)
Laboratory properly identified and coded all TIC? (Levels D, E)	Yes	No	(N/A)
Detection limits meet RDL?	Yes	(No)	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: 12 over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed?	Yes	No	N/A
GPC check performed?	Yes	No	N/A
GPC check recoveries aceptable?	Yes	No	N/A
GPC calibration performed?	Yes	No	N/A
GPC calibration check performed?	Yes	No	N/A
GPC calibration check retention times acceptable?	Yes	No	N/A
Check/calibration materials traceable?	Yes	No	N/A
Check/calibration materials Expired?	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: VOA Ground Water Protection

SAF Number: F03-006
Sample Date: 05/30/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000532							
BATCH QC ASSOCIATED WITH SAMPLE							
MS	1,1-Dichloroethene	75-35-4	112.000	% Recov	06/12/03	63.000	117.000
MS	Benzene	71-43-2	108.000	% Recov	06/12/03	75.000	129.000
MS	4-Bromofluorobenzene Surr	460-00-4	94.000	% Recov	06/12/03	84.000	116.000
MS	Chlorobenzene	108-90-7	108.000	% Recov	06/12/03	79.000	119.000
MS	1,2-Dichloroethane-d4 Surr	17060-07-0	96.000	% Recov	06/12/03	82.000	136.000
MS	Toluene-d8 Surr	2037-26-5	100.000	% Recov	06/12/03	89.000	119.000
MS	Toluene	108-88-3	108.000	% Recov	06/12/03	76.000	120.000
MS	Trichloroethene	79-01-6	108.000	% Recov	06/12/03	73.000	123.000
MSD	1,1-Dichloroethene	75-35-4	106.000	% Recov	06/12/03	63.000	117.000
MSD	Benzene	71-43-2	106.000	% Recov	06/12/03	75.000	129.000
MSD	4-Bromofluorobenzene Surr	460-00-4	94.000	% Recov	06/12/03	84.000	116.000
MSD	Chlorobenzene	108-90-7	108.000	% Recov	06/12/03	79.000	119.000
MSD	1,2-Dichloroethane-d4 Surr	17060-07-0	94.000	% Recov	06/12/03	82.000	136.000
MSD	Toluene-d8 Surr	2037-26-5	100.000	% Recov	06/12/03	89.000	119.000
MSD	Toluene	108-88-3	106.000	% Recov	06/12/03	76.000	120.000
MSD	Trichloroethene	79-01-6	104.000	% Recov	06/12/03	73.000	123.000
SPK-RPD	1,1-Dichloroethene	75-35-4	5.505	RPD	06/12/03	0.000	25.000
SPK-RPD	Benzene	71-43-2	1.869	RPD	06/12/03	0.000	25.000
SPK-RPD	4-Bromofluorobenzene Surr	460-00-4	0.000	RPD	06/12/03	0.000	25.000
SPK-RPD	Chlorobenzene	108-90-7	0.000	RPD	06/12/03	0.000	25.000
SPK-RPD	1,2-Dichloroethane-d4 Surr	17060-07-0	2.105	RPD	06/12/03	0.000	25.000
SPK-RPD	Toluene-d8 Surr	2037-26-5	0.000	RPD	06/12/03	0.000	25.000
SPK-RPD	Toluene	108-88-3	1.869	RPD	06/12/03	0.000	25.000
SPK-RPD	Trichloroethene	79-01-6	3.774	RPD	06/12/03	0.000	25.000
SURR	4-Bromofluorobenzene Surr	460-00-4	94.000	% Recov	06/12/03	71.000	125.000
SURR	1,2-Dichloroethane-d4 Surr	17060-07-0	97.000	% Recov	06/12/03	80.000	134.000
SURR	Toluene-d8 Surr	2037-26-5	100.000	% Recov	06/12/03	80.000	126.000
Lab ID: W030000533							
BATCH QC ASSOCIATED WITH SAMPLE							
SURR	4-Bromofluorobenzene Surr	460-00-4	87.000	% Recov	06/12/03	71.000	125.000
SURR	1,2-Dichloroethane-d4 Surr	17060-07-0	98.000	% Recov	06/12/03	80.000	134.000
SURR	Toluene-d8 Surr	2037-26-5	100.000	% Recov	06/12/03	80.000	126.000
BATCH QC							
BLANK	1,1-Dichloroethane	75-34-3	< 1.0	ug/Kg	06/12/03		
BLANK	1,1,1-Trichloroethane	71-55-6	< 1.0	ug/Kg	06/12/03		
BLANK	1,1,2-Trichloroethane	79-00-5	< 1.0	ug/Kg	06/12/03		
BLANK	1,1,2,2-Tetrachloroethane	79-34-5	< 1.0	ug/Kg	06/12/03		
BLANK	1,1-Dichloroethene	75-35-4	< 1.0	ug/Kg	06/12/03		
BLANK	1,2-Dichloroethane	107-06-2	< 1.0	ug/Kg	06/12/03		
BLANK	1,2-Dichloroethene (cis & tran	540-59-0	< 1.0	ug/Kg	06/12/03		

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: VOA Ground Water Protection

SAF Number: F03-006
Sample Date:
Receive Date:

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
BLANK	2-Hexanone	591-78-6	< 1.0	ug/Kg	06/12/03		
BLANK	4-Methyl-2-pentanone	108-10-1	< 1.0	ug/Kg	06/12/03		
BLANK	Acetone	67-64-1	< 1.0	ug/Kg	06/12/03		
BLANK	Bromodichloromethane	75-27-4	< 1.0	ug/Kg	06/12/03		
BLANK	Benzene	71-43-2	< 1.0	ug/Kg	06/12/03		
BLANK	4-Bromofluorobenzene Surr	460-00-4	96.000	% Recov	06/12/03	71.000	125.000
BLANK	Bromoform	75-25-2	< 1.0	ug/Kg	06/12/03		
BLANK	Carbon Disulfide	75-15-0	< 1.0	ug/Kg	06/12/03		
BLANK	Carbon Tetrachloride	56-23-5	< 1.0	ug/Kg	06/12/03		
BLANK	Dibromochloromethane	124-48-1	< 1.0	ug/Kg	06/12/03		
BLANK	Chloroform	67-66-3	< 1.0	ug/Kg	06/12/03		
BLANK	Chlorobenzene	108-90-7	< 1.0	ug/Kg	06/12/03		
BLANK	cis-1,3-Dichloropropene	10061-01-5	< 1.0	ug/Kg	06/12/03		
BLANK	Chloroethane	75-00-3	< 1.0	ug/Kg	06/12/03		
BLANK	1,2-Dichloroethane-d4 Surr	17060-07-0	104.000	% Recov	06/12/03	80.000	134.000
BLANK	1,2-Dichloropropane	78-87-5	< 1.0	ug/Kg	06/12/03		
BLANK	Ethylbenzene	100-41-4	< 1.0	ug/Kg	06/12/03		
BLANK	Bromomethane	74-83-9	< 1.0	ug/Kg	06/12/03		
BLANK	Chloromethane	74-87-3	< 1.0	ug/Kg	06/12/03		
BLANK	2-Butanone	78-93-3	< 1.0	ug/Kg	06/12/03		
BLANK	Methylene Chloride	75-09-2	< 1.0	ug/Kg	06/12/03		
BLANK	Tetrachloroethene	127-18-4	< 1.0	ug/Kg	06/12/03		
BLANK	Styrene	100-42-5	< 1.0	ug/Kg	06/12/03		
BLANK	Total Xylenes	1330-20-7	< 1.0	ug/Kg	06/12/03	0.000	300.000
BLANK	Toluene-d8 Surr	2037-26-5	100.000	% Recov	06/12/03	80.000	126.000
BLANK	Toluene	108-88-3	< 1.0	ug/Kg	06/12/03		
BLANK	trans-1,3-Dichloropropene	10061-02-6	< 1.0	ug/Kg	06/12/03		
BLANK	Trichloroethene	79-01-6	< 1.0	ug/Kg	06/12/03		
BLANK	Vinyl Chloride	75-01-4	< 1.0	ug/Kg	06/12/03		
LCS	1,1-Dichloroethene	75-35-4	98.000	% Recov	06/12/03	70.000	130.000
LCS	Benzene	71-43-2	108.000	% Recov	06/12/03	70.000	130.000
LCS	4-Bromofluorobenzene Surr	460-00-4	96.000	% Recov	06/12/03	71.000	125.000
LCS	Chlorobenzene	108-90-7	106.000	% Recov	06/12/03	70.000	130.000
LCS	1,2-Dichloroethane-d4 Surr	17060-07-0	100.000	% Recov	06/12/03	80.000	134.000
LCS	Toluene-d8 Surr	2037-26-5	100.000	% Recov	06/12/03	80.000	126.000
LCS	Toluene	108-88-3	106.000	% Recov	06/12/03	70.000	130.000
LCS	Trichloroethene	79-01-6	104.000	% Recov	06/12/03	70.000	130.000

Date: 17 November 2003
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Subject: Wet Chemistry - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 30757 prepared by WSCF. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	C	See note 1 & 2

1 - Ammonia - 350.3; pH - 9040A; IC anions - 300.0; cyanide - 9010B.
2 - Phosphate, nitrate and nitrite not validated per FHI request.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev.1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times/Sample Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for ammonia, chloride, fluoride and sulfate; 14 days for cyanide; 2 days for phosphate; and immediate (24 hours) for pH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged

"J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J".

All other holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike and LCS recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All matrix spike and LCS recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. All results met the TQL.

- **Completeness**

Data package No. 30459 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with FHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH	J	All	Holding time

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: FLUOR-HANFORD															
Laboratory: WSCF															
Case	SDG: WSCF20030757														
Sample Number		B171B9													
Remarks															
Location															
Sample Date		5/30/03													
Wet Chemistry	TQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Ammonia	0.5	253													
Cyanide	0.5	<0.200	U												
pH		8.42	J												
Bromide		<22.5	U												
Chloride	2	12.4													
Fluoride	5	<3.50	U												
Nitrate*	2.5	165													
Nitrite*	2.5	<4.50	U												
Phosphate*	5	<6.50	U												
Sulfate	5	647													

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000532	B171C0	GPP TRENT	75-01-4	Vinyl Chloride	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	10061-01-5	cis-1,3-Dichloropropene	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	10061-02-6	trans-1,3-Dichloropropene	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	TPHKEROSENE	Kerosene	SOLID	NWTPH	U	< 1.50e+04	ug/kg	1.00	1.5e+04	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	68476-34-6	Total Pet. Hydrocarbons Diesel	SOLID	NWTPH	U	< 1.50e+04	ug/kg	1.00	1.5e+04	06/12/03	05/30/03	06/03/03
W030000532	B171C0	GPP TRENT	84-15-1	ortho-Terphenyl	SOLID	NWTPH		9.10e+04	ug/kg	1.00	2.0e+03	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7664-41-7	Ammonia (N) by IC	SOLID	LA-503-401		253	ug/g	5.00e+002	2.0	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	57-12-5	Cyanide by Midi/Spectrophotom	SOLID	LA-695-402	U	< 0.200	mg/kg		0.20	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	TS	Percent Solids	SOLID	LA-519-412		96.2	%		0.0	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	PH	pH Soil and Waste Measurement	SOLID	LA-212-411	J	8.42	pH		0.010	06/11/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14596-10-2	Am-241 by AEA	SOLID	LA-508-471		2.00	pCi/g		0.32	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Am-241 by AEA Total Cntg Error	SOLID	LA-508-471		24.0	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	24959-67-9	Bromide (Br) by IC	SOLID	LA-533-410	U	< 22.5	ug/g	5.00e+002	22	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	16887-00-6	Chloride (Cl) by IC	SOLID	LA-533-410		12.4	ug/g	5.00e+002	7.0	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	16984-48-8	Fluoride (F) by IC	SOLID	LA-533-410	U	< 3.50	ug/g	5.00e+002	3.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	NO3-N	Nitrate (N) by IC	SOLID	LA-533-410		165	ug/g	5.00e+002	2.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	NO2-N	Nitrite (N) by IC	SOLID	LA-533-410	U	< 4.50	ug/g	5.00e+002	4.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14265-44-2	Phosphate (P) by IC	SOLID	LA-533-410	U	< 6.50	ug/g	5.00e+002	6.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14808-79-8	Sulfate (SO4) by IC	SOLID	LA-533-410		647	ug/g	5.00e+002	12	06/10/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Ac-228 Rel.% Count Error (GEA)	SOLID	LA-508-462		133	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14331-83-0	Ac-228 by GEA	SOLID	LA-508-462	U	-18.6	pCi/g		41	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Am-241 Rel.% Count Error (GEA)	SOLID	LA-508-462		308	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14596-10-2	Am-241 by GEA	SOLID	LA-508-462	U	-17.8	pCi/g		92	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Bi-212 Rel.% Count Error (GEA)	SOLID	LA-508-462		887	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14913-49-6	Bi-212 by GEA	SOLID	LA-508-462	U	-7.87	pCi/g		1.2e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Bi-214 Rel.% Count Error (GEA)	SOLID	LA-508-462		1.00e+03	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14733-03-0	Bi-214 by GEA	SOLID	LA-508-462	U	-1.75	pCi/g		34	06/13/03	05/30/03	06/03/03

MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
U - Analyzed for but not detected above limiting criteria.
J - Estimated Value

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	**WSCF20030757**
Sample Matrix	**Soil**
Sample Visual	**Brown**
SAF Number	**F03-006**
Data Deliverable	**Summary Report**

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Protection Program- Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.

- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.

- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.

- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale
WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline
Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-006-144	Page 1 of 1
Collector Johansen/Pope/Pfister	Company Contact LC Hulstrom	Telephone No. 373-3928	Project Coordinator TRENT, SJ	Price Code 8N Air Quality ☐	Data Turnaround 60 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location ~~MS 5-29-03~~ 216-B-12 (C3246); ~~(32'35') 30 32.5~~ (35.5-38')		SAF No. F03-006		
Ice Chest No.	Field Logbook No. HNF-N-3361	COA 117504ES10	Method of Shipment Government Vehicle		
Shipped To 222-S Lab Operations WSCF KT 6/3/03	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A		

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

76030757

Preservation	Cool 4C	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	2	1	2 RSC-30-03	1							
Volume	40mL	40mL	~~120mL~~ 60mL	60mL							
SAMPLE ANALYSIS	VOA - 8260A - Complete	Semi-VOA - 8270A (TCL); PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.							
	STL	STL	W	E				TIELTO:			

Sample No.	Matrix *	Sample Date	Sample Time									
B171B9 W030000533	SOIL	5-30-03	1140							B171P0		

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
[illegible] 5-30-03 1415	HO-64-4277 RLF 5-30-03 1415	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
HO-64-4277 Ref 6/03/03 1315	Greg Thomas Greg Thomas 6/03/03 1315	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Greg Thomas Greg Thomas 6/03/03 1400	[signature] [signature] 6/3/03 1400	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	

SPECIAL INSTRUCTIONS

** The laboratory is to report both kerosene and diesel range compounds from WTPH-D analysis.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Antimony-125, Cesium-134, Radium-226, Radium-228, Tin-126); Isotopic Plutonium; Americium-241; Isotopic Uranium; Total Uranium; ICP Metals - 6010A (SW-846) (Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Bismuth, Boron, Lead, Selenium); Mercury ~~7471 - (CV)~~, IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate); Total Cyanide - 9010; Ammonia - 350.1; pH (Soil) - 9045

~~(2) Technetium-99; Strontium-89,90 - Sr-90; Isotopic Thorium (Thorium-232); Neptunium-237; Iodine-129~~

WTPH-D & WTPH-G / MAN/06-05-03

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

#1 - 200.8 & 6010 / MAN 06-05-03

0000018

3-14

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-PW-2 / 200-PW-4			DATA PACKAGE: WSCF20030757		
VALIDATOR: TLI		LAB: WSCF		DATE: 10/18/03	
CASE:			SDG: WSCF20030757		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate	Cyanide	
SAMPLES/MATRIX					
BH1B7					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

_____

_____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: NO FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A

Spike standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: NO MS/MSD 10/4

NO LCS 10/4

NO DAJ

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	(Yes)	No	N/A
Duplicate results acceptable?	(Yes)	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	(N/A)
MS/MSD standards expired? (Levels D, E)	Yes	No	(N/A)
Field duplicate RPD values acceptable?	Yes	No	(N/A)
Field split RPD values acceptable?	Yes	No	(N/A)
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments:

6. HOLDING TIMES (all levels)

Samples properly preserved?	(Yes)	No	N/A
Sample holding times acceptable?	Yes	(No)	N/A

Comments: pH - >2x Jall
~~phosphate >2x 12R~~ 12/16

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?	(Yes)	No	N/A
Rresults supported in the raw data? (Levels D, E)	Yes	No	(N/A)
Samples properly prepared? (Levels D, E)	Yes	No	(N/A)
Detection limits meet RDL?	Yes	(No)	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: ~~Kerosene TPH-Diesel TPH~~ 10/18/03 10/18/03 over

Appendix 6

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: Anions by Ion Chromatography

SAF Number: F03-006
Sample Date: 06/03/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000530							
BATCH QC ASSOCIATED WITH SAMPLE							
DUP	Bromide (Br) by IC	24959-67-9	n/a	RPD	06/09/03	0.000	20.000
DUP	Chloride (Cl) by IC	16887-00-6	n/a	RPD	06/09/03	0.000	20.000
DUP	Fluoride (F) by IC	16984-48-8	n/a	RPD	06/09/03	0.000	20.000
DUP	Nitrite (N) by IC	NO2-N	n/a	RPD	06/09/03	0.000	20.000
DUP	Nitrate (N) by IC	NO3-N	8.889	RPD	06/09/03	0.000	20.000
DUP	Phosphate (P) by IC	14265-44-2	n/a	RPD	06/09/03	0.000	20.000
DUP	Sulfate (SO4) by IC	14808-79-8	1.592	RPD	06/09/03	0.000	20.000
MS	Bromide (Br) by IC	24959-67-9	94.975	% Recov	06/10/03	75.000	125.000
MS	Chloride (Cl) by IC	16887-00-6	99.897	% Recov	06/10/03	75.000	125.000
MS	Fluoride (F) by IC	16984-48-8	101.636	% Recov	06/10/03	75.000	125.000
MS	Nitrite (N) by IC	NO2-N	93.058	% Recov	06/10/03	75.000	125.000
MS	Nitrate (N) by IC	NO3-N	93.049	% Recov	06/10/03	75.000	125.000
MS	Phosphate (P) by IC	14265-44-2	93.535	% Recov	06/10/03	75.000	125.000
MS	Sulfate (SO4) by IC	14808-79-8	98.447	% Recov	06/10/03	75.000	125.000
MSD	Bromide (Br) by IC	24959-67-9	100.503	% Recov	06/10/03	75.000	125.000
MSD	Chloride (Cl) by IC	16887-00-6	109.091	% Recov	06/10/03	75.000	125.000
MSD	Fluoride (F) by IC	16984-48-8	108.793	% Recov	06/10/03	75.000	125.000
MSD	Nitrite (N) by IC	NO2-N	98.016	% Recov	06/10/03	75.000	125.000
MSD	Nitrate (N) by IC	NO3-N	100.224	% Recov	06/10/03	75.000	125.000
MSD	Phosphate (P) by IC	14265-44-2	100.104	% Recov	06/10/03	75.000	125.000
MSD	Sulfate (SO4) by IC	14808-79-8	103.046	% Recov	06/10/03	75.000	125.000
BATCH QC							
BLANK	Bromide (Br) by IC	24959-67-9	<4.50e-2	mg/L	06/09/03	0.000	300.000
BLANK	Bromide (Br) by IC	24959-67-9	<4.50e-2	mg/L	06/10/03	0.000	300.000
BLANK	Chloride (Cl) by IC	16887-00-6	<1.40e-2	mg/L	06/09/03	0.000	300.000
BLANK	Chloride (Cl) by IC	16887-00-6	<1.40e-2	mg/L	06/10/03	0.000	300.000
BLANK	Fluoride (F) by IC	16984-48-8	<7.00e-3	mg/L	06/09/03	0.000	300.000
BLANK	Fluoride (F) by IC	16984-48-8	<7.00e-3	mg/L	06/10/03	0.000	300.000
BLANK	Nitrite (N) by IC	NO2-N	<9.00e-3	mg/L	06/09/03	0.000	300.000
BLANK	Nitrite (N) by IC	NO2-N	<9.00e-3	mg/L	06/10/03	0.000	300.000
BLANK	Nitrate (N) by IC	NO3-N	<5.00e-3	mg/L	06/09/03	0.000	300.000
BLANK	Nitrate (N) by IC	NO3-N	<5.00e-3	mg/L	06/10/03	0.000	300.000
BLANK	Phosphate (P) by IC	14265-44-2	<1.30e-2	mg/L	06/09/03	0.000	300.000
BLANK	Phosphate (P) by IC	14265-44-2	<1.30e-2	mg/L	06/10/03	0.000	300.000
BLANK	Sulfate (SO4) by IC	14808-79-8	<2.40e-2	mg/L	06/09/03	0.000	300.000
BLANK	Sulfate (SO4) by IC	14808-79-8	<2.40e-2	mg/L	06/10/03	0.000	300.000
LCS	Bromide (Br) by IC	24959-67-9	100.249	% Recov	06/09/03	80.000	120.000
LCS	Chloride (Cl) by IC	16887-00-6	98.500	% Recov	06/09/03	80.000	120.000
LCS	Fluoride (F) by IC	16984-48-8	106.383	% Recov	06/09/03	80.000	120.000
LCS	Nitrite (N) by IC	NO2-N	96.078	% Recov	06/09/03	80.000	120.000
LCS	Nitrate (N) by IC	NO3-N	99.556	% Recov	06/09/03	80.000	120.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: Anions by Ion Chromatography

SAF Number: F03-006
Sample Date:
Receive Date:

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
LCS	Phosphate (PI by IC	14265-44-2	102.167	% Recov	06/09/03	80.000	120.000
LCS	Sulfate (SO4) by IC	14808-79-8	103.008	% Recov	06/09/03	80.000	120.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: Ammonia (N) by IC

SAF Number: F03-006
Sample Date: 06/03/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000530							
BATCH QC ASSOCIATED WITH SAMPLE							
DUP	Ammonia (N) by IC	7664-41-7	8.943	RPD	06/09/03	0.000	20.000
MS	Ammonia (N) by IC	7664-41-7	81.212	% Recov	06/09/03	75.000	125.000
MSD	Ammonia (N) by IC	7664-41-7	83.636	% Recov	06/09/03	75.000	125.000
BATCH QC							
BLNK-PREP	Ammonia (N) by IC	7664-41-7	<4.00e-3	Ratio	06/09/03		
BLNK-PREP	Ammonia (N) by IC	7664-41-7	<4.00e-3	Ratio	06/09/03		
LCS	Ammonia (N) by IC	7664-41-7	98.673	% Recov	06/09/03	80.000	120.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: Cyanide by Midi/Spectrophotom

SAF Number: F03-006
Sample Date: 06/03/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000530							
BATCH QC ASSOCIATED WITH SAMPLE							
MS	Cyanide by Midi/Spectrophotom	57-12-5	101.100	% Recov	06/12/03	75.000	125.000
MSD	Cyanide by Midi/Spectrophotom	57-12-5	100.100	% Recov	06/12/03	75.000	125.000
SPK-RPD	Cyanide by Midi/Spectrophotom	57-12-5	0.994	RPD	06/12/03	0.000	20.000
BATCH QC							
BLANK	Cyanide by Midi/Spectrophotom	57-12-5	1.072	ug/L	06/12/03	-4.000	4.000
BLNK-PREP	Cyanide by Midi/Spectrophotom	57-12-5	1.836	ug/L	06/12/03	-4.000	4.000
DUP	Cyanide by Midi/Spectrophotom	57-12-5	n/a	RPD	06/12/03	0.000	20.000
LCS	Cyanide by Midi/Spectrophotom	57-12-5	89.310	% Recov	06/12/03	85.000	115.000
LCS-2	Cyanide by Midi/Spectrophotom	57-12-5	n/a	% Recov	06/12/03	80.000	120.000

1

Date: 17 November 2003
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200–PW-4 OU Borehole Soil Sampling
Subject: Inorganics - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 30757 prepared by WSCF. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Levelnnnn	Analysis
B171B9	5/30/03	Soil	C	See note 1

1 - ICP metals by 6010A and 200.8.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample Analysis

Matrix spike (MS), matrix spike duplicate (MSD) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125% for matrix spike analysis. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required. LCS recoveries must fall within limits specified by the laboratory.

Due to an LCS recovery outside QC limits, all antimony (73.9%) results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits, all silver (5.3%) results were rejected and flagged "UR".

Due to the lack of a MS analysis, all aluminum results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (54.8%), all bismuth results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike and matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than +/- 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to the lack of a duplicate analysis, all ICP-MS results were qualified as estimates and flagged "J".

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Limits**

Reported analytical detection levels are compared against the target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. The silver, lead and beryllium results exceeded the TQL. Under the BHI statement of work, no qualification is required. All other results met the analyte specific TQL.

- **Completeness**

Data package No. 30757 was submitted for validation and verified for completeness.

Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 96%.

MAJOR DEFICIENCIES

Due to a matrix spike recovery outside QC limits, all silver (5.3%) results were rejected and flagged "UR". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to an LCS recovery outside QC limits, all antimony (73.9%) results were qualified as estimates and flagged "J". Due to the lack of a MS analysis, all aluminum results were qualified as estimates and flagged "J". Due to the lack of a matrix spike duplicate analysis, all ICP-MS results were qualified as estimates and flagged "J".Due to an LCS recovery outside QC limits (54.8%), all bismuth results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with FHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bismuth	J	All	LCS recovery
Antimony	J	All	LCS recovery
Aluminum	J	All	No MS analysis
Silver	UR	All	MS recovery
All	J	All	No duplicate analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: FLUOR HANFORD															
Laboratory: WSCF															
Case	SDG: WSCF20030757														
Sample Number		B171B9													
Remarks															
Sample Date		5/30/03													
Inorganics	TQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Bismuth		<4.41	UJ												
Boron		<4.500	U												
Aluminum		6420	J												
Antimony	6	<2.36	UJ												
Arsenic	1	3.74	J												
Barium	20	28.2	J												
Beryllium	0.5	<1.42	UJ												
Cadmium	0.5	<0.473	UJ												
Chromium	1	6.94	J												
Cobalt		3.80	J												
Copper	2.5	5.92	J												
Lead	1	<5.68	UJ												
Manganese		139	J												
Mercury	0.2	1.31	J												
Molybdenum		<1.42	UJ												
Nickel	4	5.48	J												

0000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4
Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	13967-48-1	Ru-106 by GEA	SOLID	LA-508-462	U	24.9	pCi/g		1.6e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Sb-125 Rel.% Count Error (GEA)	SOLID	LA-508-462		871	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14234-35-6	Sb-125 by GEA	SOLID	LA-508-462	U	5.19	pCi/g		73	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Sn-113 Rel.% Count Error (GEA)	SOLID	LA-508-462		248	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	13966-06-8	Sn-113 by GEA	SOLID	LA-508-462	U	-7.50	pCi/g		30	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Sn-126 Rel.% Count Error (GEA)	SOLID	LA-508-462		92.4	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	15832-50-5	Sn-126 by GEA	SOLID	LA-508-462	U	25.1	pCi/g		38	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Th-234 Rel.% Count Error (GEA)	SOLID	LA-508-462		117	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	15065-10-8	Th-234 by GEA	SOLID	LA-508-462	U	-359	pCi/g		7.0e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Tl-208 Rel.% Count Error (GEA)	SOLID	LA-508-462		268	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	14913-50-9	Tl-208 by GEA	SOLID	LA-508-462	U	4.07	pCi/g		18	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	U-235 Rel.% Count Error (GEA)	SOLID	LA-508-462		289	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	15117-96-1	U-235 by GEA	SOLID	LA-508-462	U	-24.0	pCi/g		1.2e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Zn-65 Rel.% Count Error (GEA)	SOLID	LA-508-462		92.6	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	13982-39-3	Zn-65 by GEA	SOLID	LA-508-462	U	14.0	pCi/g		21	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-69-9	Bismuth by ICP	SOLID	LA-505-411	U	< 4.41	ug/g	44.14	4.4	06/25/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	~~7440-42-8~~	Boron by ICP	SOLID	LA-505-411	U	< 4.500	ug/g	44.14	4.502	06/25/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7429-90-5	Aluminum by ICP-MS	SOLID	LA-505-412	E	6.42e+03	ug/g	4.73	52	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-36-0	Antimony by ICP-MS	SOLID	LA-505-412	U	< 2.36	ug/g	4.73	2.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-38-2	Arsenic by ICP-MS	SOLID	LA-505-412		3.74	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-39-3	Barium by ICP-MS	SOLID	LA-505-412		28.2	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-41-7	Beryllium by ICP-MS	SOLID	LA-505-412	U	< 1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-43-9	Cadmium by ICP-MS	SOLID	LA-505-412	U	< 0.473	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-47-3	Chromium by ICP-MS	SOLID	LA-505-412		6.94	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-48-4	Cobalt by ICP-MS	SOLID	LA-505-412		3.80	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-50-8	Copper by ICP-MS	SOLID	LA-505-412		5.92	ug/g	4.73	2.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7439-92-1	Lead by ICP-MS	SOLID	LA-505-412	U	< 5.68	ug/g	4.73	5.7	06/18/03	05/30/03	06/03/03

0001011

7440-42-8 Nayes 8/16/04

MDL=Minimum Detection Limit E - Analyte is an estimate, has potentially larger errors J - Estimated Value
RQ=Result Qualifier U - Analyzed for but not detected above limiting criteria.

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report W004/ver. 5.1
Ground Water Protection Program

WSCF
ANALYTICAL RESULTS REPORT

2-37

Attention: Steve Trent
Project: F03-006: 200-PW-2/PW-4

Group #: WSCF20030757

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ		Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B171B9	GPP TRENT	7439-96-5	Manganese by ICP-MS	SOLID	LA-505-412			139	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7439-97-6	Mercury by ICP-MS	SOLID	LA-505-412			1.31	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7439-98-7	Molybdenum by ICP-MS	SOLID	LA-505-412	U	<	1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-02-0	Nickel by ICP-MS	SOLID	LA-505-412			5.48	ug/g	4.73	2.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7782-49-2	Selenium by ICP-MS	SOLID	LA-505-412	U	<	1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-22-4	Silver by ICP-MS	SOLID	LA-505-412	U	<	0.946	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-28-0	Thallium by ICP-MS	SOLID	LA-505-412	U	<	0.473	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-29-1	Thorium by ICP-MS	SOLID	LA-505-412			3.46	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-61-1	Uranium by ICP-MS	SOLID	LA-505-412			28.0	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-62-2	Vanadium by ICP-MS	SOLID	LA-505-412			45.4	ug/g	4.73	1.9	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	7440-66-6	Zinc by ICP-MS	SOLID	LA-505-412			25.4	ug/g	4.73	19	06/18/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	TPH-G	Total Pet. Hydrocarbons Gas	SOLID	NWTPH	U	<	500	ug/kg		5.0e+02	06/12/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	12674-11-2	Aroclor-1016	SOLID	LA-523-427	U	<	110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11104-28-2	Aroclor-1221	SOLID	LA-523-427	U	<	110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11141-16-5	Aroclor-1232	SOLID	LA-523-427	U	<	110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	53469-21-9	Aroclor-1242	SOLID	LA-523-427	U	<	110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	12672-29-6	Aroclor-1248	SOLID	LA-523-427	U	<	110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11097-69-1	Aroclor-1254	SOLID	LA-523-427	J		140	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11096-82-5	Aroclor-1260	SOLID	LA-523-427	U	<	110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	37324-23-5	Aroclor-1262	SOLID	LA-523-427	U	<	110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	11100-14-4	Aroclor-1268	SOLID	LA-523-427	U	<	110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	13981-16-3	Pu-238 by AEA	SOLID	LA-508-471	U		-0.120	pCi/g		0.32	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Pu-238 by AEA Total Cntg Error	SOLID	LA-508-471			140	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOLID	LA-508-471			21.0	%		0.0	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	PU-239/240	Pu-239/240 by AEA	SOLID	LA-508-471			3.90	pCi/g		0.077	06/17/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	120-82-1	1,2,4-Trichlorobenzene	SOLID	LA-523-456	U		< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9	GPP TRENT	95-50-1	1,2-Dichlorobenzene (SV)	SOLID	LA-523-456	U		< 1.90e+03	ug/kg	1.00	1.9e+03	06/09/03	05/30/03	06/03/03

0000212

MDL=Minimum Detection Limit
RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
J - Estimated Value
U - Analyzed for but not detected above limiting criteria.

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

10/16/03

Report W004/ver. 5.1
Ground Water Protection Program

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	**WSCF20030757**
Sample Matrix	**Soil**
Sample Visual	**Brown**
SAF Number	**F03-006**
Data Deliverable	**Summary Report**

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Protection Program- Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.
- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.
- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale
WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline
Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-006-144	Page 1 of 1
Collector Johansen/Pope/Pfister	Company Contact LC Hulstrom	Telephone No. 373-3928	Project Coordinator TRENT, SJ	Price Code 8N Air Quality ☐	Data Turnaround 60 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location ~~ms 5-29-03~~ 216-B-12 (C3246); ~~(32'-35')~~ ~~30-32.5~~ (35.5-38')		SAF No. F03-006		
Ice Chest No.	Field Logbook No. HNF-N-3361	COA 117504ES10	Method of Shipment Government Vehicle		
Shipped To WSCF 222-S Lab Operations KT 6/3/03	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	None						
Special Handling and/or Storage 70030757	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	2	1	2 MOC-30-03	1						
	Volume	40mL	40mL	~~120mL~~ 100mL	60mL						
SAMPLE ANALYSIS		VOA - 8260A - Complete	Semi-VOA - 8270A (TCL); PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						
		STL	STL	W	F			TIELD:			

Sample No.	Matrix *	Sample Date	Sample Time									
B171B9 W030000533	SOIL	5-30-03	1140							B171P2		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	5-30-03 1415	HO-64-4277 REF	5-30-03 1415
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
HO-64-4277 Ref	6/03/03 1315	Greg Thomas Greg Thomas	6/3/03 1315
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas Greg Thomas	6/03/03 1400	K Bebb K Bebb	6/3/03 1400
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

**The laboratory is to report both kerosene and diesel range compounds from WTPH-D analysis.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Antimony-125, Cesium-134, Radium-226, Radium-228, Tin-126); Isotopic Plutonium; Americium-241; Isotopic Uranium; Total Uranium; ICP Metals - 6010A (SW-846) (Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Bismuth, Boron, Lead, Selenium); Mercury - ~~7471 - (CVAA)~~; IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate); Total Cyanide - 9010; Ammonia - 350.1; pH (Soil) - 9045

~~(2) Technetium-99; Strontium-89,90 - Sr-90; Isotopic Thorium (Thorium-232); Neptunium-237; Iodine-129~~

WTPH-D & WTPH-G / MAN 06-05-03

Matrix *
S=Soil
SE=Sediment
SD=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

#1 - 200.8 & 6010 / MAN 06-05-03

0000147

3-14

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-PW-2/200-PW-4			DATA PACKAGE: WSCF200307S7		
VALIDATOR: TLI		LAB: WSCF		DATE: 10/18/03	
CASE:			SDG: 30757		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
B71B9					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No (N/A)
ICB and CCB results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: NO FB

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes (No) N/A
MS/MSD results acceptable? ..... Yes (No) N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... Yes (No) N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: Bismuth LCS 54.8% — J all

Antimony - LCS 73.9 J all

aluminum - NO MS J

Silver 5% - UR

NO PDS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	Yes	(No)	N/A
Duplicate results acceptable?	Yes	(No)	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	(N/A)
MS/MSD standards expired? (Levels D, E)	Yes	No	(N/A)
Field duplicate RPD values acceptable?	Yes	No	(N/A)
Field split RPD values acceptable?	Yes	No	(N/A)
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: No Dup ICP-MS – Jall

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	N/A
ICP serial dilution %D values acceptable?	Yes	No	N/A
ICP post digestion spike required?	Yes	No	N/A
ICP post digestion spike values acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?	(Yes)	No	N/A
Rresults supported in the raw data? (Levels D, E)	Yes	No	(N/A)
Samples properly prepared? (Levels D, E)	Yes	No	(N/A)
Detection limits meet RDL?	(Yes)	(No)	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: Silver, lead, Beryllium CRA

Appendix 6

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: ICP-2008 MS All possible metal

SAF Number: F03-006
Sample Date: 06/03/03
Receive Date: 06/03/03

Lab ID: W030000530

BATCH QC ASSOCIATED WITH SAMPLE

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
MS	Silver by ICP-MS	7440-22-4	5.354	% Recov	06/18/03	70.000	130.000
MS	Aluminum by ICP-MS	7429-90-5	n/a	% Recov	06/18/03	70.000	130.000
MS	Arsenic by ICP-MS	7440-38-2	97.980	% Recov	06/18/03	70.000	130.000
MS	Barium by ICP-MS	7440-39-3	105.051	% Recov	06/18/03	70.000	130.000
MS	Beryllium by ICP-MS	7440-41-7	99.495	% Recov	06/18/03	70.000	130.000
MS	Cadmium by ICP-MS	7440-43-9	97.475	% Recov	06/18/03	70.000	130.000
MS	Cobalt by ICP-MS	7440-48-4	93.939	% Recov	06/18/03	70.000	130.000
MS	Chromium by ICP-MS	7440-47-3	96.465	% Recov	06/18/03	70.000	130.000
MS	Copper by ICP-MS	7440-50-8	92.929	% Recov	06/18/03	70.000	130.000
MS	Mercury by ICP-MS	7439-97-6	95.565	% Recov	06/18/03	70.000	130.000
MS	Manganese by ICP-MS	7439-96-5	104.545	% Recov	06/18/03	70.000	130.000
MS	Molybdenum by ICP-MS	7439-98-7	94.949	% Recov	06/18/03	70.000	130.000
MS	Nickel by ICP-MS	7440-02-0	96.970	% Recov	06/18/03	70.000	130.000
MS	Lead by ICP-MS	7439-92-1	104.040	% Recov	06/18/03	70.000	130.000
MS	Antimony by ICP-MS	7440-36-0	88.889	% Recov	06/18/03	70.000	130.000
MS	Selenium by ICP-MS	7782-49-2	95.455	% Recov	06/18/03	70.000	130.000
MS	Thorium by ICP-MS	7440-29-1	101.515	% Recov	06/18/03	70.000	130.000
MS	Thallium by ICP-MS	7440-28-0	98.990	% Recov	06/18/03	70.000	130.000
MS	Uranium by ICP-MS	7440-61-1	97.980	% Recov	06/18/03	70.000	130.000
MS	Vanadium by ICP-MS	7440-62-2	98.485	% Recov	06/18/03	70.000	130.000
MS	Zinc by ICP-MS	7440-66-6	97.980	% Recov	06/18/03	70.000	130.000

BATCH QC

BLANK	Silver by ICP-MS	7440-22-4	<0.200	ug/L	06/18/03	-0.440	0.440
BLANK	Aluminum by ICP-MS	7429-90-5	<11.0	ug/L	06/18/03	-24.200	24.200
BLANK	Arsenic by ICP-MS	7440-38-2	<0.300	ug/L	06/18/03	-0.660	0.660
BLANK	Barium by ICP-MS	7440-39-3	<0.200	ug/L	06/18/03	-0.440	0.440
BLANK	Beryllium by ICP-MS	7440-41-7	<0.300	ug/L	06/18/03	-0.660	0.660
BLANK	Cadmium by ICP-MS	7440-43-9	<0.100	ug/L	06/18/03	-0.220	0.220
BLANK	Cobalt by ICP-MS	7440-48-4	<0.200	ug/L	06/18/03	-0.440	0.440
BLANK	Chromium by ICP-MS	7440-47-3	<0.300	ug/L	06/18/03	-0.660	0.660
BLANK	Copper by ICP-MS	7440-50-8	<0.500	ug/L	06/18/03	-1.100	1.100
BLANK	Mercury by ICP-MS	7439-97-6	<0.100	ug/L	06/18/03	-0.220	0.220
BLANK	Manganese by ICP-MS	7439-96-5	<0.300	ug/L	06/18/03	-0.660	0.660
BLANK	Molybdenum by ICP-MS	7439-98-7	<0.300	ug/L	06/18/03	-0.660	0.660
BLANK	Nickel by ICP-MS	7440-02-0	<0.500	ug/L	06/18/03	-1.100	1.100
BLANK	Lead by ICP-MS	7439-92-1	<1.20	ug/L	06/18/03	-2.640	2.640
BLANK	Antimony by ICP-MS	7440-36-0	0.505	ug/L	06/18/03	-1.100	1.100
BLANK	Selenium by ICP-MS	7782-49-2	<0.300	ug/L	06/18/03	-0.660	0.660
BLANK	Thorium by ICP-MS	7440-29-1	<0.200	ug/L	06/18/03	-0.440	0.440
BLANK	Thallium by ICP-MS	7440-28-0	<0.100	ug/L	06/18/03	-0.220	0.220
BLANK	Uranium by ICP-MS	7440-61-1	<0.100	ug/L	06/18/03	-0.220	0.220

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: ICP-2008 MS All possible metal

SAF Number: F03-006
Sample Date:
Receive Date:

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
BLANK	Vanadium by ICP-MS	7440-62-2	<0.400	ug/L	06/18/03	-0.880	0.880
BLANK	Zinc by ICP-MS	7440-66-6	<4.00	ug/L	06/18/03	-8.800	8.800
LCS	Silver by ICP-MS	7440-22-4	127.731	% Recov	06/18/03	85.000	115.000 *
LCS	Aluminum by ICP-MS	7429-90-5	95.745	% Recov	06/18/03	85.000	115.000
LCS	Arsenic by ICP-MS	7440-38-2	100.000	% Recov	06/18/03	85.000	115.000
LCS	Barium by ICP-MS	7440-39-3	96.429	% Recov	06/18/03	85.000	115.000
LCS	Beryllium by ICP-MS	7440-41-7	101.195	% Recov	06/18/03	85.000	115.000
LCS	Cadmium by ICP-MS	7440-43-9	97.376	% Recov	06/18/03	85.000	115.000
LCS	Cobalt by ICP-MS	7440-48-4	91.329	% Recov	06/18/03	85.000	115.000
LCS	Chromium by ICP-MS	7440-47-3	88.786	% Recov	06/18/03	85.000	115.000
LCS	Copper by ICP-MS	7440-50-8	94.488	% Recov	06/18/03	85.000	115.000
LCS	Mercury by ICP-MS	7439-97-6	89.479	% Recov	06/18/03	85.000	115.000
LCS	Manganese by ICP-MS	7439-96-5	93.333	% Recov	06/18/03	85.000	115.000
LCS	Molybdenum by ICP-MS	7439-98-7	94.545	% Recov	06/18/03	85.000	115.000
LCS	Nickel by ICP-MS	7440-02-0	104.904	% Recov	06/18/03	85.000	115.000
LCS	Lead by ICP-MS	7439-92-1	103.386	% Recov	06/18/03	85.000	115.000
LCS	Antimony by ICP-MS	7440-36-0	73.913	% Recov	06/18/03	85.000	115.000 *
LCS	Selenium by ICP-MS	7782-49-2	103.509	% Recov	06/18/03	85.000	115.000
LCS	Thorium by ICP-MS	7440-29-1	98.222	% Recov	06/18/03	85.000	115.000
LCS	Thallium by ICP-MS	7440-28-0	106.426	% Recov	06/18/03	85.000	115.000
LCS	Uranium by ICP-MS	7440-61-1	98.992	% Recov	06/18/03	85.000	115.000
LCS	Vanadium by ICP-MS	7440-62-2	93.293	% Recov	06/18/03	85.000	115.000
LCS	Zinc by ICP-MS	7440-66-6	101.509	% Recov	06/18/03	85.000	115.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757
Matrix: SOLID
Test: ICP Metals Analysis, Grd H20 P

SAF Number: F03-006
Sample Date: 06/03/03
Receive Date: 06/03/03

QC Type	Analyte	CAS #	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID: W030000530							
BATCH QC ASSOCIATED WITH SAMPLE							
MS	Boron by ICP	7440-50-8	91.238	% Recov	06/25/03	75.000	125.000
MS	Bismuth by ICP	7440-69-9	97.340	% Recov	06/25/03	75.000	125.000
MSD	Boron by ICP	7440-50-8	90.999	% Recov	06/25/03	75.000	125.000
MSD	Bismuth by ICP	7440-69-9	98.000	% Recov	06/25/03	75.000	125.000
SPK-RPD	Boron by ICP	7440-50-8	0.263	RPD	06/25/03	0.000	20.000
SPK-RPD	Bismuth by ICP	7440-69-9	0.676	RPD	06/25/03	0.000	20.000
BATCH QC							
BLANK	Boron by ICP	7440-50-8	2.9	ug/L	06/25/03	-10.000	10.000
BLANK	Bismuth by ICP	7440-69-9	<0.1	ug/L	06/25/03	-1.000	0.088
LCS	Boron by ICP	7440-50-8	98.827	% Recov	06/25/03	80.000	120.000
LCS	Bismuth by ICP	7440-69-9	54.809	% Recov	06/25/03	80.000	120.000